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Caution

This manual contains necessary information to operate the system safely. Please read this manual before attempting to use the system.

This system has been designed with safety consideration of the operators and the patients. However, to ensure the system reliability and safety, please pay attention to the following:

- **This system shall be operated only by or under the guidance of a qualified person.**
- **This system complies with Type B general equipment, Class I of EN606601-1:1990+A1:1993+A2:1995 standard.**
- **Do not modify this system in any way. Necessary modifications can be made only by the manufacturer or its designated agents.**
- **This system is fully adjusted at the factory. Do not adjust any fixed adjustable parts.**
- **In the event of a malfunction, turn off the power supply immediately and inform the manufacturer or its designated agents.**
- **The power cable of the system must be connected to a grounded power socket. Do not remove the ground cable for any reason.**
- **Only the devices comply with EN606601-1:1990+A1:1993+A2:1995 standard can be connected with the system, either electronically or mechanically. Recheck the leakage current and other safety performance indices of the entire system to avoid potential system damage caused by leakage from a current superposition.**
- **The system has no any specialized design when it is configured with high-frequency operation devices. The operator shall use caution in these types of applications.**

- **The system is designed to provide medical information on clinical diagnosis for doctors. The doctors shall be responsible for determining diagnostic results, while the manufacturer shall not assume any responsibility for such diagnostic process.**
- **Please back up the important data of the system to external storage media, such as a U disk or a DVD.**
- **The manufacturer shall not be responsible for any loss of stored data in the system due to any malfunction.**

Due to functional update, this user's manual may be slightly different from the system you are using.

Regulatory Requirement

This product complies with regulatory requirements of the following European directive 93/42/EEC concerning medical devices.

CE 0434

1 System Safety

1.1 Safety Overview

Safety measures for the operator and the patient are discussed in this section. To ensure the safety of the operator and patient, please read the relevant details in this chapter carefully before operating this system. Meanwhile, in this manual the description on warning means that any violation of the relevant rules may result in personal injury or even risk of life to the operator or the patient.

The following precautions should be adhered to:

1. This system complies with Type B general equipment, Class I, EN606601-1:1990+A1:1993+A2:1995 standard. Please follow Section 1. “System Safety” in the user’s manual to operate this system properly.
2. Do not modify this system in any way. Necessary modifications can be made only by the manufacturer or its designated agents.
3. This system is fully adjusted before delivery from the factory. Do not adjust any fixed adjustable parts.
4. If any disorder occurs during operation, please turn off the power supply immediately and inform our designated contact persons or us.
5. The power cable of the system should be connected to a grounded power socket, and the ground cable should not be removed.
6. Only the devices comply with EN606601-1:1990+A1:1993+A2:1995 standard can be connected with the system, either electronically or mechanically. It is required to recheck the leakage current and other safety performance indexes of the whole system to avoid any potential hazard to the system resulted from leakage current superposition.

7. When it is configured with high-frequency operation devices, no special protective measures are supplies for the system. The operator should be vigilant to such application.
8. The installation shall be performed by personnel authorized by the manufacturer only. Do not attempt to install the system by yourself
9. Service shall be performed by service engineer authorized by the manufacturer only.
10. The system shall be used by a qualified operator or under the supervision of a qualified person.
11. The system is not designed to be operated in the presence of flammable substances. Such an environment could cause an explosion.
12. Power down the system before cleaning. Protect the system from water or other liquids that could drip into the system.
13. To ensure the safety of the patient, continuous scanning and imaging for a long period on the same part of the patient is prohibited.
14. When the system is used for ultrasound scanning, it shall be used with ultrasound gel without problem in biological compatibility. To ensure safety, only qualified ultrasound gel in compliance with related standard can be used.
15. At the end of the life time of this product, please contact your local agent or our company for disposal.

1.2 Warning Signs

Signs	Description
	Type B Applied Part symbol classified as electric shock prevention
	Dangerous voltage
	Attention; To secure system safety, wherever this sign is found in the system or documents please refer to relevant instructions in the user's manual.
	OFF (The power disconnected from the unit)
	ON (The power connected to the unit)
	Equi-potentiality sign; The terminal shall be connected with the corresponding connection terminal of other devices, to ensure the equation of electric.
	Alternating current
	Operating the system in the presence of flammable gas is prohibited; Otherwise it may cause an explosion.
	Direct current

1.3 Biological safety

This product should be used only for valid reasons and should be used both for the shortest period of time and at the lowest power settings necessary (ALARA - As Low As Reasonably Achievable) to produce acceptable diagnostically image.

1.4 Ultrasound Safety

Keep the transducers clean. The transducers shall be cleaned before scanning another patient.

Patients should always be exposed to the lowest transmit power for the shortest time. Freeze the system or keep the probe away from the patient if no scanning is performed. Do not scan the patient with the probe at a fixed position of the body for a long time; Please refer to Appendix C for acoustic report of the system.

1.5 Operating Environment

- The unit should be operated within the parameter outline below:
  - Relative humidity: 30％～75% non-condensing
  - Ambient temperature: 10℃ ～ 40℃
  - Atmosphere Pressure: 700～1060hPa
- Strong radiation source or powerful electromagnetic waves, e.g. electromagnetic waves from radio broadcasting, may result in image ghosting or noise. The system shall be isolated from such radiation source or electromagnetic waves.
- Do not put anything on top of the main unit.
- When the system is not in use, be sure to turn off the power supply. Cover the main unit with a dust cover. The system shall be operated in the environment without dust.

1.6 Transport and storage

- The following transport and storage environmental conditions are within system tolerances:
  - Relative humidity: 20%～90％ non-condensing
  - Ambient temperature: -20℃ ～40℃
  - Atmosphere Pressure: 700～1060hPa

1.7 Electrical Requirements

- Power Requirements: 100-240V~, 50/60Hz
- Power Consumption: 130 VA
- Main unit voltage: With a fluctuation range of less than ±10%，otherwise the system may be damaged.
- Grounding: Before connecting the power cable, connect the attached ground protection cable to a special grounding device.

NOTE:

Please follow the above requirements for power supply to the system.

The requirements of power supply may vary in different areas. Please refer to the symbols at the rear panel of the system for the detailed requirements.

1.8 Electrical Safety Classification

- This safety standard of this system complies with Type B, Class I EN606601-1:1990+A1:1993+A2:1995;
- It belongs to continuous operation (for more than 8 hours) according to operation mode;
- According to the classification on harmful liquid protection(Main unit:IPX0 Transducers:IPX4)
- The system should NOT be used under the condition with the inflammable mixture of anesthesia gas and air, or oxygen and nitrous oxide;
- This equipment meets the requirements for EMC/EMI IEC60601-1-2 Class A (CE);
- The system shall be added with a ground device protection. During operation, please make sure that the system is connected to an extra grounding device. Otherwise it may be interfered by alternating current and affected in imaging quality.

2 System Description

2.1 General

The system is a full digital portable B/W diagnostic ultrasound system with high performance. With the most advanced full digital ultrasound design in the industry, the system is configured with high performance super large scale integration, and human tissue ultrasound information can be acquired to its best capability; In combination with professional built-in Linux computer system, rich data ports, professional application packages and standard Windows style interface, the system is featured with high performance, as well as powerful software function and easy operation.

A high-performance industrial-grade LCD is used on the systems. Other than the traditional systems, clear image display and abundant gray scales can be found on this system, meanwhile the system weight is reduced significantly.

Moreover, the professional built-in operation system and the standard PC ports enable the user to perform system upgrade and maintenance without effort, while maintaining the advantages of its technologies.

2.2 Application

The system, with electronic scanning ultrasound diagnostic capabilities, is suitable for all kinds of clinical diagnosis. It can work with many multi-freq transducers, and can apply to general organs. Its main applications are as follows:

- Small parts (breast, thyroid, testes, etc.)
- Vascular (cerebrovascular, peripheral vascular)
- Abdominal (liver, spleen, gallbladder, kidney, etc.)
- Gynecological
- Cardiac
- Urological
- Musculo-skeletal

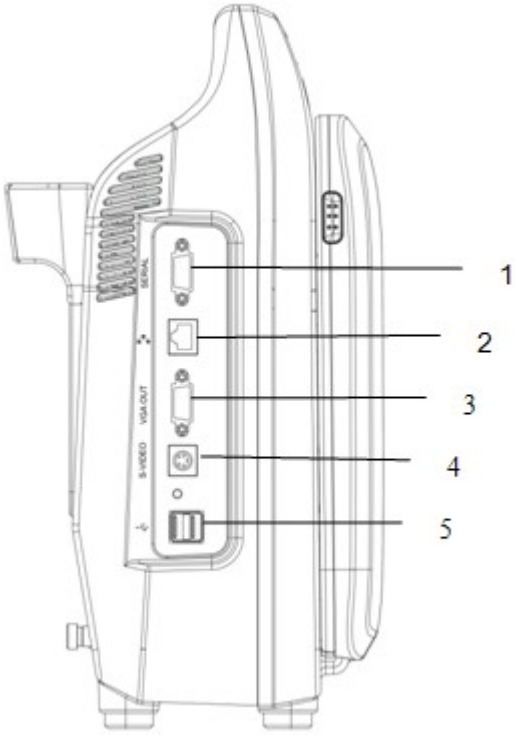
2.3 Contraindication

No Contraindication. But the system is not intended for OPHTHALMIC use or any use that causes the acoustic beam to pass through the eye(s).

2.4 System Configuration

2.4.1 Configuration

The system consists of a main unit and transducer(s).



1. **RS232 Port**
2. **LAN Port（DICOM Port）**
3. **VGA Port**
4. **S-Video Port**
5. **Double USB Port**

2.4.2 Standard Configuration

- Host 1 pc
- Power cable 1 pc
- Configurable transducers (models and quantity are subject to customer requirements. See Section 4.3 for transducer models.)
- Protective ground cable 1 pc
- Fuse 1.6A/250V 2 pcs
- S-terminal cable 1 pc
- BNC video cable 1 pc
- USB2.0 cable 1 pc
- VGA video cable 1 pc
- Ultrasound gel 1 bottle

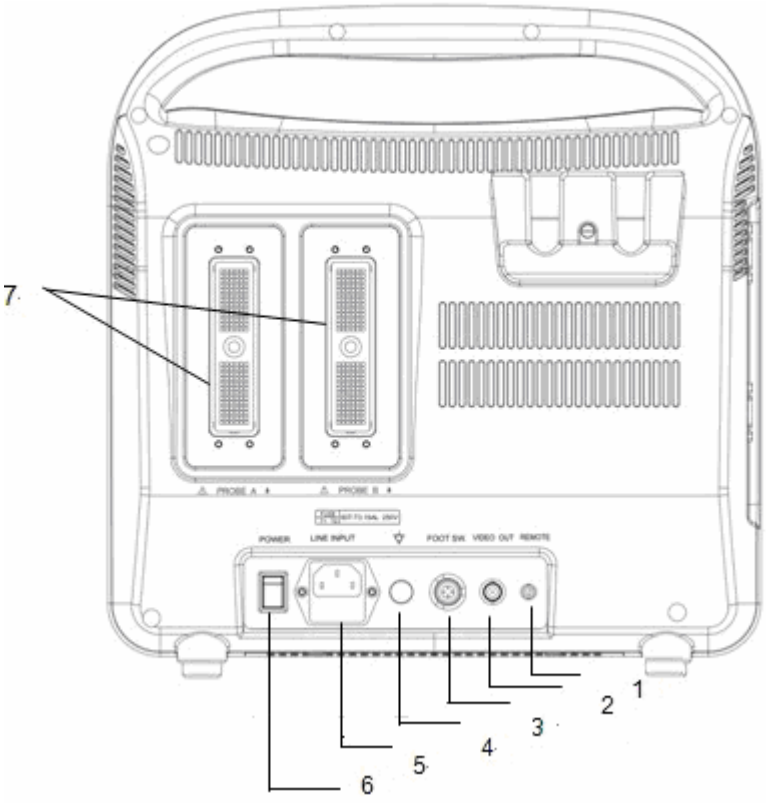
2.4.3 Optional Accessories

- DVD Combo
- Footswitch
- Biopsy guide
- Trolley
- Special backpack
- Configurable transducers (See Section 4.3 for transducer models.)

2.4.4 Optional Peripherals

- USB2.0 memory stick
- USB2.0 mobile hard disk
- USB2.0 DVD-RW

- USB2.0 video printer
- Composite video printer
- Network printer
- VCR



1. **REMOTE Control Port**
2. **S-Video Port**
3. **Foot Switch**
4. **Ground Pole**
5. **Power Connector with Fuse-box**
6. **Power Switch**
7. **Probe Connectors**

2.5 Technical Specifications

- All digital beam former
- Dynamic receive focusing, dynamic aperture, dynamic apodization;
- Transducer: multiple-frequency transducer, 5-frequency, frequency range 2.0-12.0MHz;
- Probe connector: 2 slots
- Scanning range:
  - Convex array: Max depth300mm
  - Linear array: depth 123mm, width 46mm
  - Micro-convex array: Max angle 180°, during 2.0MHz, max Depth 320mm
- Grayscale: 256
- Dynamic range: 108dB;
- Imaging mode: THI , B , B+B , B+M , M , 4B;
- Scanning lines: 256 lines in B mode max. 256 lines in M mode max;
- Line density: low, high;
- Edge enhancement: 8 steps;
- Grayscale curve: 16 types;
- Persistence: 8 steps;
- Chroma: 8 types;
- Frequency: 5 steps;
- Focusing method: dynamic focusing, variable aperture;
- Focus number: Max 4, focus number and depth controllable
- Frame rate: max 60 frames;
- Gain control: gain 0～255, encoder adjust; 8-TGC; independent

gain control for B and M modes;

- Zoom factor: max. 8.0, local zoom function;
- M mode: sweep speed 1，2，3，4，5s;
- M mode video invertion;
- Biopsy guide line: on/off, position and angle adjustment;
- User adjustable parameters: dynamic range, frequency, GSC, persistence, gain, grayscale curve, left/right invert, up/down invert, image rotation angle, sweep angle/width, depth, line density, zoom factor, focus number and position, biopsy guide line, acoustic power, chroma pitcure;
- Diagnostic mode: applications such as cardiac, liver, kidney, muscular-skeletal, gynecological, obstetric, thyroid, carotid, breast and pancreas; exam mode preset by the user;
- Cine and storage**:**
  - In B mode, 256 frames with high line density, or 512 frames with low density; 128s in M mode;
  - A flash can store up to 2000 images in bmp format, 10000 images in JPG format after power off.
  - Cine speed adjustable: high, medium, low;
  - Measurement when reviewing images;
- Clipboard function: the latest reviewed images (up to 32 images) can be shown at the bottom right of the screen;
- Body mark: not less than 80 type;
- Annotation: rich annotations, the user can add new annotations;
- Measurement:
  - Basic measurement: distance, ratio, area (ellipse), circumference, angle, volume, time, slope, heart rate
  - OB measurement: BPD, CRL, FL, AC, HC, GS, VOL, ANG LE, UT, OFD, CI, AFI, FGC

- Cardiac measurement: MV, LV, AO, EDV, ESV, EF, CO, SV, FS, ET
- Other measurement: RUV, PV, and so on

- Report: cardiac report, vascular report, OB/GYN, growth curve, urology;
- Display: 12-inch industrial-grade LCD, the user can adjust the monitor through system menu;
- Built-in Linux system;
- Standard PS2-port keyboard, backlight display, high-brightness control, keyboard with beeper prompt;
- Multiple language operation interface: Simplified Chinese/ Traditional Chinese/ English/ Russian/ Spanish/ French/ Italian;
- Input in Chinese/ English;
- Video out format: composite video, S-Video, VGA;
- Output ports: LAN, 2×USB2.0, composite video, VGA, S-Video, print control;
- Input port: footswitch;
- DVD-RW (Option);
- Optional peripherals: footswitch, video printer, USB video printer, USB disk, mobile hard disk, network device, VCR;
- DICOM function: (Option);
- File output format:
  - Image: BMP, JPG, AVI,DCM;
  - Report: .RPT;
- Software update: USB update by the user or update through Flash replacement;
- Power in: 100-240V～, 50/60Hz auto adaption;
- External dimension: 336×180×346mm(L×W×H

- Net weight: 6.5Kg;
- Environmental requirement:

	Operation	Storage and Transport
Ambient temperature:	10℃ ~ 40℃	-20℃ ~ 55℃
Relative humidity:	30％ ~ 75%	20% ~ 90％
Atmospheric pressure:	700 ~ 1060hPa	700 ~ 1060hPa

2.6 System Principle

The fundamental operating principle of diagnostic ultrasound system is: through the transducer, electric excitation signals are converted into acoustic signals, which are propogated, attenuated and reflected in the patient's body. Then the echos from the body are converted into electric signals through the transducer. Going through complicated signal processing circuit, a scanned tomographic image is displayed on the monitor.

The block diagram of the system is displayed below:

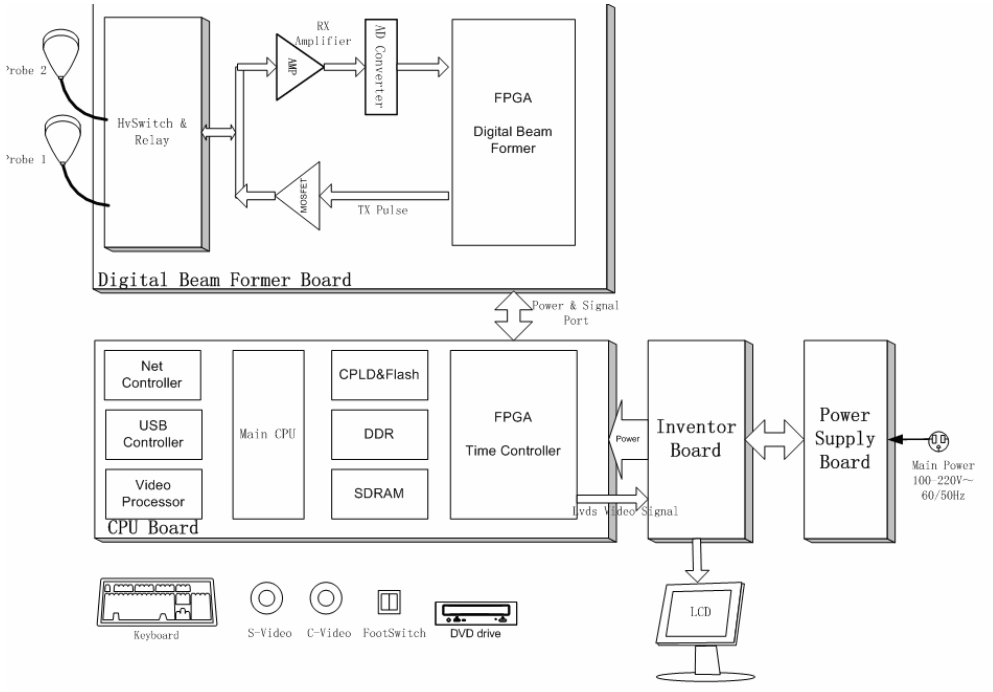


Fig.2-6a Block Diagram

According to the design, the Digital Beam Former sends out transmit pulse signals at a certain frequency. Going through signal driving and logic switch, the signals are sent to the elements of the transducer. With the oscillation of element, ultrasonic waves are generated. The combinations of many element signals enable the transducer to send out a dynamic directional compounded beam. Then the beam is propogated and attenuated in the human body. When the echo returned to the element crystal, it will be changed to electric signals again. Being amplified by the pre-amplifier, the signals are sent for A/D conversion, through which analog signals are converted to digital signals, compounded in the beam former, go through digital signal processing such as filtering, logarithm compression, detection and form digital beam data stream. The beam data steam is sent to the CPU board goes through scan transform and video processing. Finally, an ultrasonic image is displayed on the monitor.

The core of the CPU board is a built-in Linux system. In addition to completing display of ultrasonic images, it accepts keyboard operation commands from the user, and changes them to internal executable commands. Moreover, it will achieve all kinds of measurement and calculation, data input and output of peripheral ports, and so on. The system can also work with peripheral devices such as a printer, a network device or an external memory, so as to extend system functions.

3 System Operation

3.1 Operation Notice

Warning:

1. The system shall be operated by a trained medical operator;
2. Before using this system, please read the relevant sections in the manual carefully.

3.2 Transducer Connection

The transducer ports are at the back of the system.

With the cable side of transducer socket downward, plug in the transducer and turn the transducer knob clockwise to lock it. To remove the transducer, turn the knob counter clockwise and plug out the transducer. The transducer can by plugged in either of the two ports.

See the following figures:

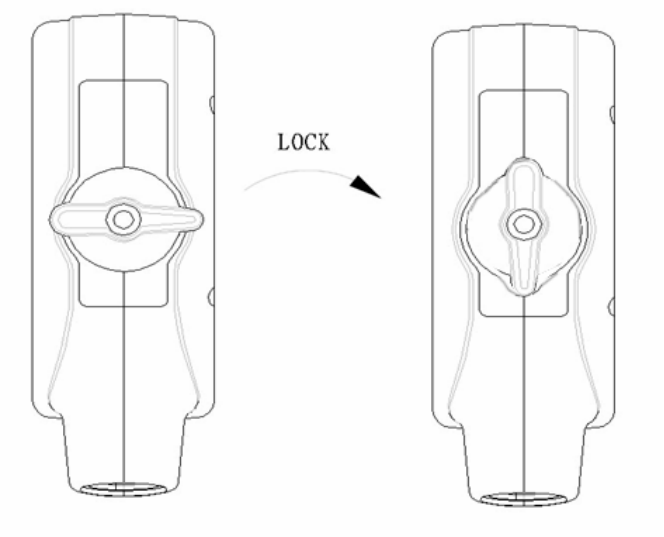


Fig. 3.2a How to connect a transducer

NOTE:

To ensure normal system functioning, please plug in or out the transducer only when the system is powered off or in frozen state.

3.3 System Power ON/OFF

Warning:

Before the system is powered on, read the relevant description in Section 1.8 Electrical Safety carefully.

Before the system is powered on, please make sure that:

1. The specifications of the power complies with the labeled power spec at the rear panel of the system;
2. The protective grounding terminal of the rear panel is connected well with the ground via the ground cable provided with the system;
3. The power switch on the rear panel is in OFF state;

➢ System power connection

Connect the system to the power supply with the power cable provided with the system.

➢ Power on the system

When the system power is connected, press the power switch on the rear panel to turn on the system. When the system is turned on, the backlight on keyboard will on, and the screen will show logo of splash screen. The system will complete the initialization in about 1 minute and go to exam mode select screen.

➢ **Turning off the system**

Switch the power switch on the rear panel to off state, and the system will be turned ff immediately.

➢ **Reset**

If any abnormal situation, such as software failure occurs on the system, press the reset key on the side board to reset the system; The reset process will restart the main board work state, and start the software system, but does not restart the power supply.

NOTE:

The reset key can be used for reset function with the tip of a non-metal object such as a pencil. Generally the user is not recommended to perform such operation directly. It shall be carried out by an engineering staff only.

3.4 General Operation

3.4.1 Keyboard Operation

The system is designed with backlit keyboard. Based on user operation habit, the keys are arranged in a optimized method, so that the user can immediately achieve all the complicated operations.

There are 65 keys (10 numerical keys[0～9], 26 character keys [A～Z], 6 control keys, and 23 function keys), 3 digital encoders with buttons (FUNC, MENU, GAIN) and 8-step TGC on the keyboard.

By pressing 【Shift】key, the upper case of that key can be actived.

The keyboard control panel is shown as below.

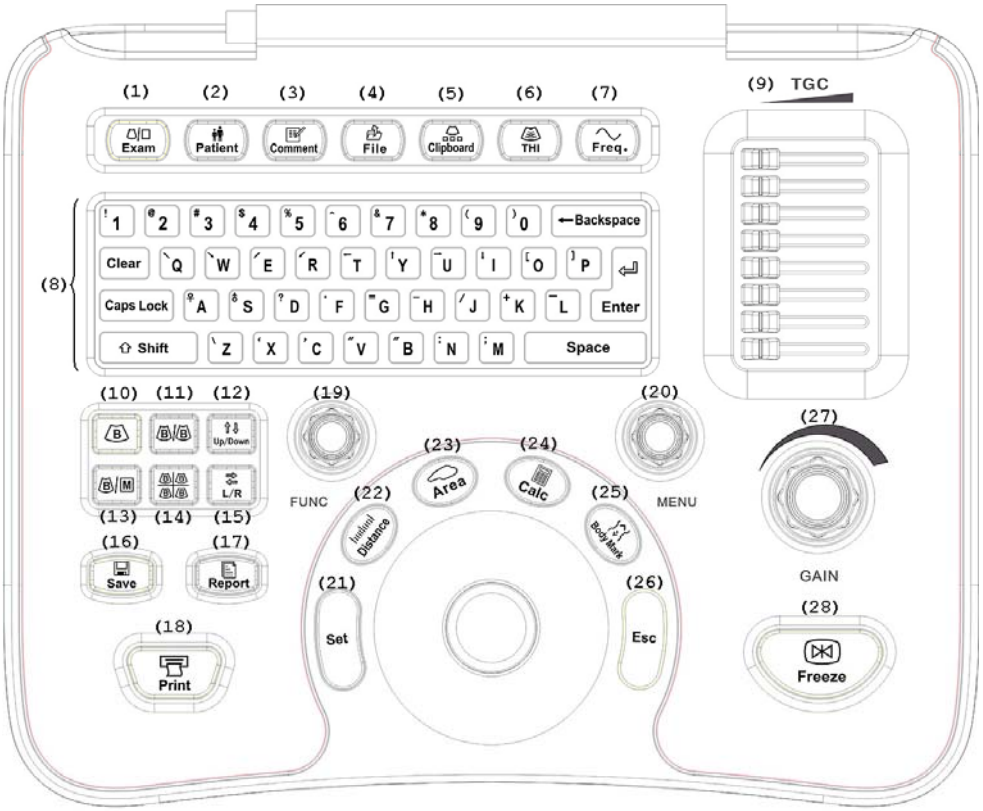


Fig. 3-4-1a Keyboard Control Panel

Basic functions of each key are shown in the following table.

Item	English	Description of Function
(1)	Exam	Select an exam mode for the transducer
(2)	Patient	Input patient information
(3)	Comment	Input comments
(4)	File	Go to disk management system
(5)	Clipboard	Go to clipboard function
(6)	THI	Tissue Harmonic Imaging
(7)	Freq.	Change transducer frequency
(8)	Character, number key, Control key	Input characters or numbers; Caps Lock: capital lock; Shift: to activate upper case definition; Backspace: to delete characters one by one; Clear: clear all information

Item	English	Description of Function
(9)	TGC	Adjust ultrasound echo gain in depth direction
(10)	B	B mode
(11)	B/B	Dual B mode, or switch the activation between the left and right images
(12)	Up/Down	Invert the image vertically
(13)	B/M	B/M and full M mode
(14)	4B	4B mode
(15)	L/R	Invert the image horizontally
(16)	SAVE	Save exam mode; save single images or cine-loop
(17)	REPORT	Go to exam report screen
(18)	PRINT	Print the current screen
(19)	FUNC	Press the key to switch between depth, focus or zoom rate functions, and adjust parameter of the current state
(20)	MENU	Press the key to go to system setup menu and image adjust menu; Use the knob to adjust menu parameter of the current image
(21)	Set	Input confirm key, increase, left key function;
(22)	Distance	Distance measurement mode
(23)	Area	Go to ellipse, trace area measurement mode
(24)	Calc	B mode or M mode measurement mode
(25)	Bodymark	Go to body mark mode
(26)	Esc	Cancel input key, decrease, right key function
(27)	GAIN	Adjust B or M image gain
(28)	Freeze	Freeze or unfreeze the image

Table 3.4.1 Description of Key Function

3.4.2 User Interface

The main user interface is shown below:

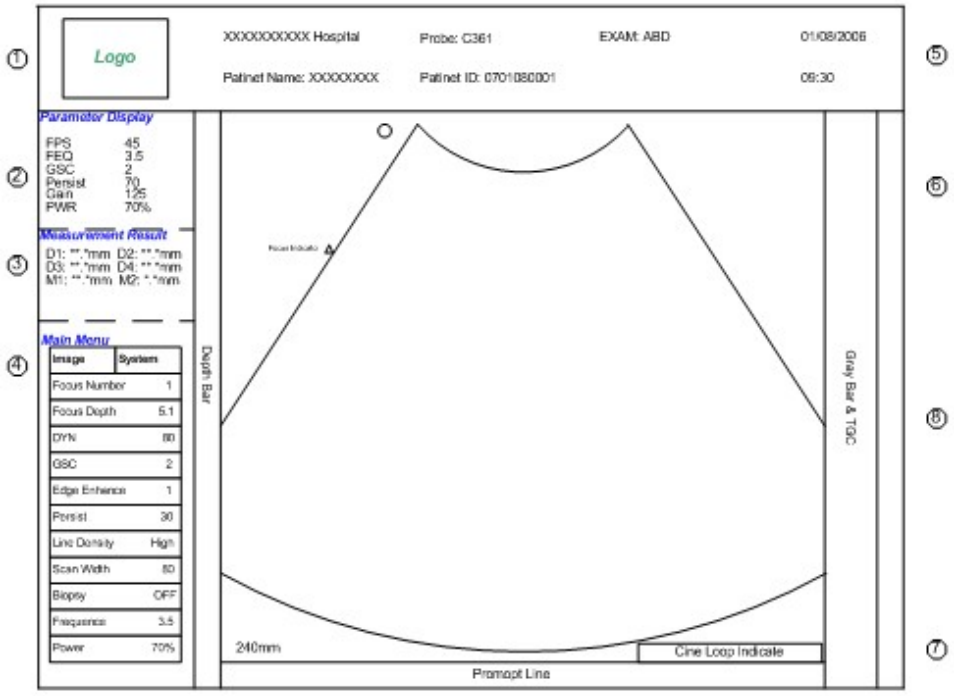


Fig. 3.4.2a Main User Interface

The functions of the main sections on the interface are shown below:

1. Logo of manufacturer
2. Image parameter area
3. Measurement result area
4. Image/measurement menu area
5. System information area
6. Imaging area
7. User prompt
8. Grayscale bar/TGC curve

3.4.3 System Setting

In exam mode select page, press the【MENU】 key, and it will show the System Setting page. Press the【MENU】key again, or click [Exit], it will exit the System Setting page.

The System Setting screen is shown below:

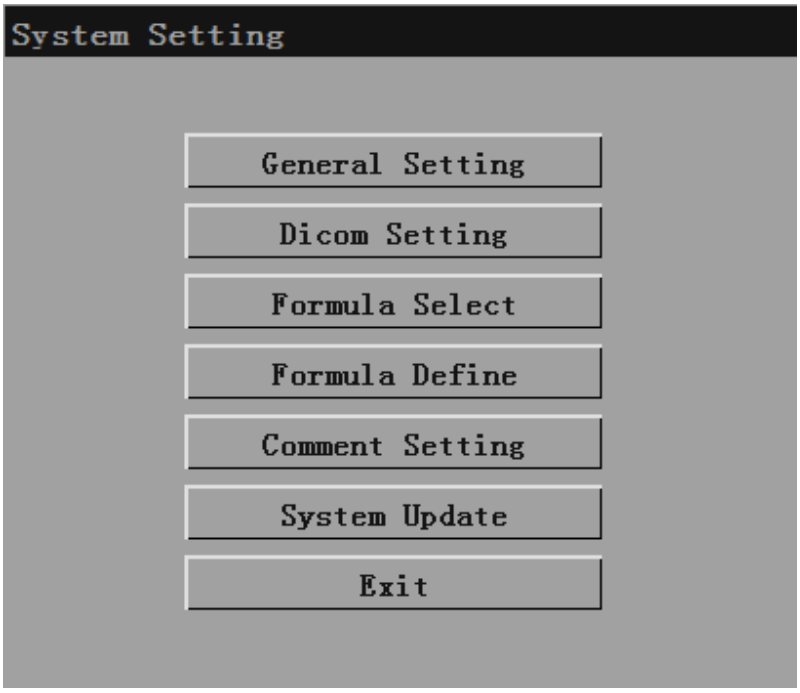


Fig. 3.4.3a System Setting

System Setting includes: General Setting, Dicom Setting, Formula Setting, Formula Define, Comment Setting.Click the item selected to enter the relative interface.

3.4.3.1 General Setting

In the **System Setting** page, click [General Setting] to go to General Setting page.

General Setting page is shown below:

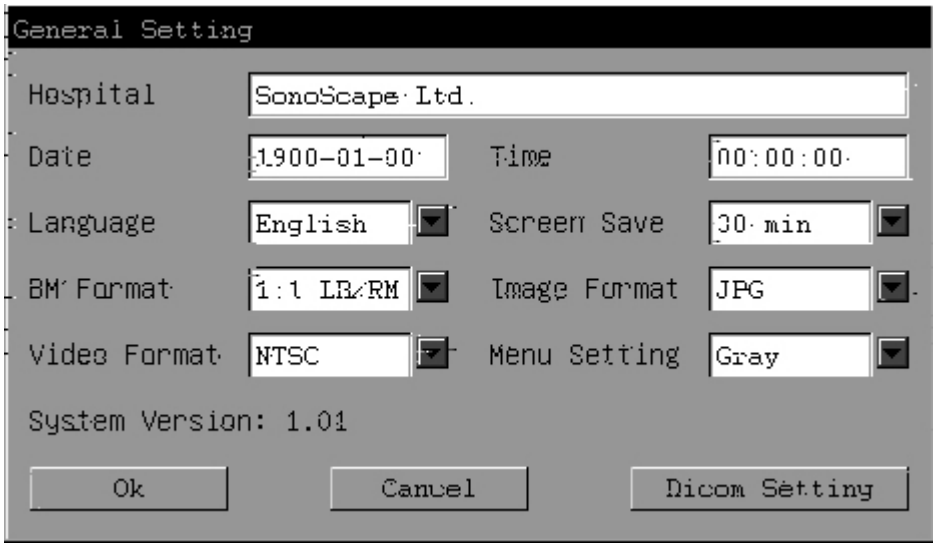


Fig. 3.4.3.1-a General Setting page

The setup options of General Setting are shown below:

Hospital Name	Key in by the keyboard, up to 20 Chinese characters or 40 English characters can be inputted.
Date	To input the system date as YYYY-MM-DD.
Time	To input system time as per the format HH:MM: SS.
Language	Select one language from the combo-box: Simplified Chinese, Traditional Chinese, English, Spanish, Russian, Italian or French.
Screen Save	combo-box select, OFF, 5 Min, 30 Min.
B/M Type	combo-box select, 1:1 LB/RM, 1:1 TB/BM, 1:2 TB/BM.
Image Format	combo-box select, JPG, BMP, DCM.

Video Format	combo-box select, NTSC, PAL.
System Color	combo-box select, Gray, Color.
System Ver.	Un-modifiable, to review system release information.
Confirmation	exit and save the curent setting
Cancel	exit without saving
Load default	load default the setting imformation

3.4.3.2 Dicom Setting

In **General Setting** page, click [DICOM Setting]. If the system is configured with DICOM, it will go to DICOM Setting screen; otherwise the screen will show a prompt message.

DICOM Setting page is shown below:

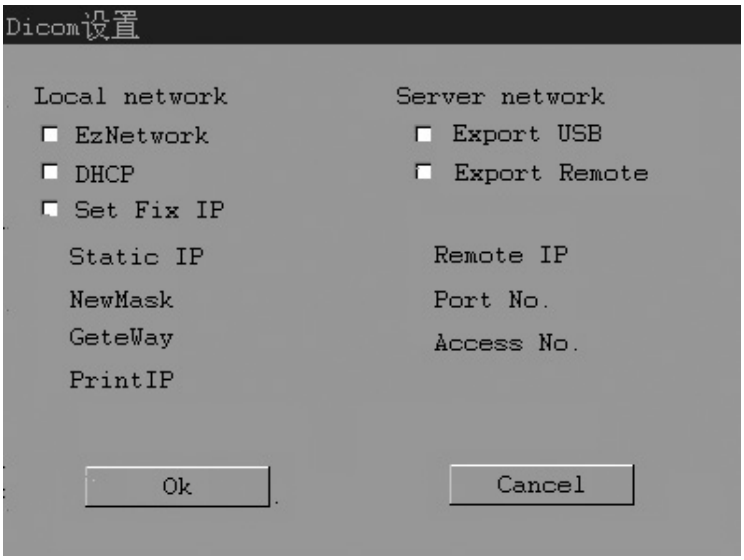


Fig. 3.4.3.1-b Dicom Setting page

The setting items for Dicom Setting are shown below:

◆ **Local Setting:**

- **Active** To turn on/off network; to check Active select box means to enable the function; only when the function is active, the system can perform network connection; when the function is active, select DHCP Setting or Fix IP.
- **DHCP Setting** The system IP address configuration.
- **Fix IP** Configure Static IP, Sub IP, Gateway, Printer IP address.

◆ **DICOM Server:**

- **Transfer to USB** User can transfer DICOM files through USB;
- **Transfer to Server** User can configure remote IP, port, Access number. When it is setted, DICOM files can be transferred through network;

In General Setting, click [Ok], it will exit and save the current setting info; click [Cancel], it will exit without saving.

3.4.3.3 Formula Select

In **System Setting** page, click [Formula Select], go to Formula Select page. Click [Save] to exit and save the current setting info; click [Exit] to exit without saving the current setting info.

The formula select page is shown below:

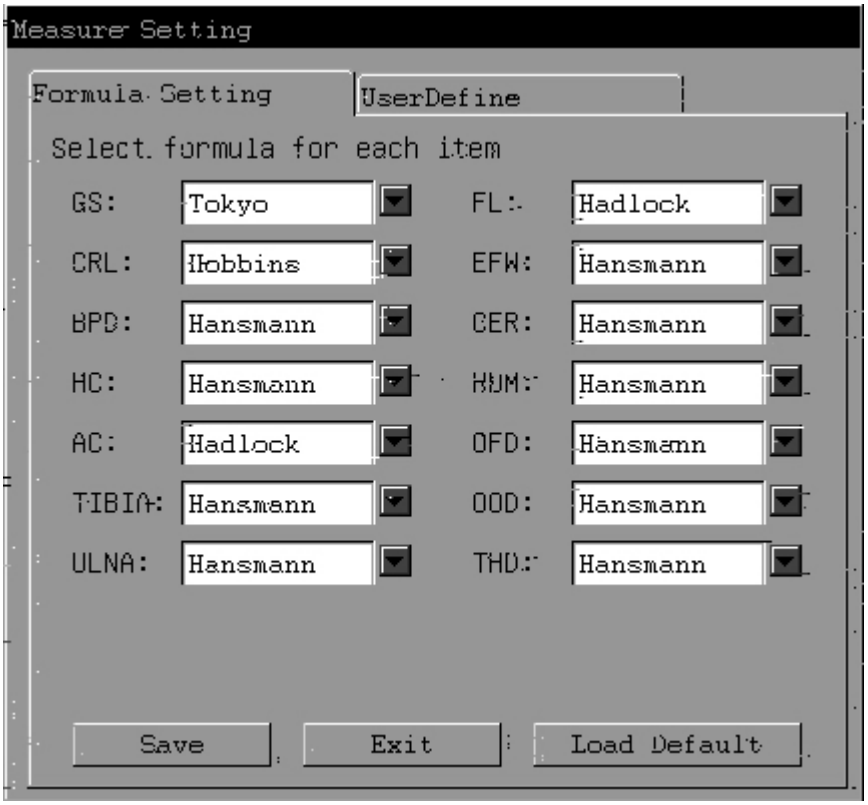


Fig. 3.4.3.3 Formula select label

The measurement items and the setting method of formula select are shown below:

- **GS** Select GS measurement formula from the combo-box.
- **FL** Select FL measurement formula from the combo-box.
- **…** **…**
- **THD** Select THD measurement formula.
- **Save** Exit and save the formula selected
- **Exit** Exit without saving
- **Load Default** Load the default formula for all measurement.

3.4.3.4 Formula Define

In **System Setting** page, click [Formula Define], go to Formula Define page. Click [Save] to exit and save the current setting info; click [Exit] to exit without saving the current setting info.

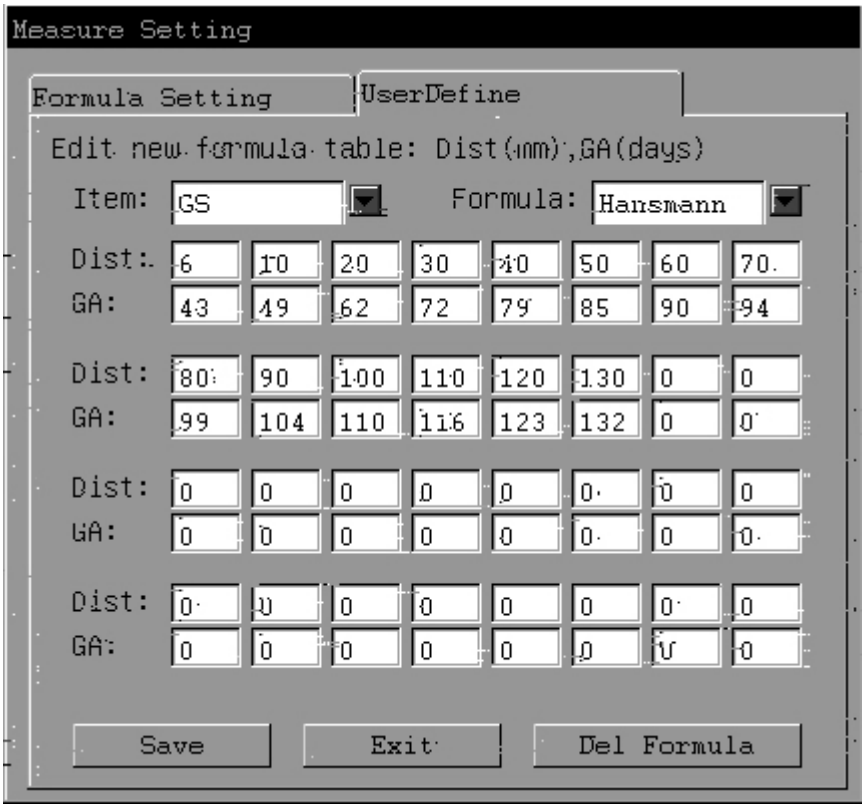

Measure Setting
Formula Setting
UserDefine
Edit new formula table: Dist(mm),GA(days)
Item: GS
Formula: Hansmann
Dist: 6 10 20 30 40 50 60 70
GA: 43 49 62 72 79 85 90 94
Dist: 80 90 100 110 120 130 0 0
GA: 99 104 110 116 123 132 0 0
Dist: 0 0 0 0 0 0 0 0
GA: 0 0 0 0 0 0 0 0
Dist: 0 0 0 0 0 0 0 0
GA: 0 0 0 0 0 0 0 0
Save
Exit
Del Formula

Fig. 3.4.3.4 User-defined formula label

In the User Define formula, the user can create a user define table for each measurement.

The measurement items and the setting method of User Define formula are shown below:

- **Measurement** Select the measurement item to be edited from the com-box.
- **Formula** Select the formula of measurement item from the com-box.
- **Dist** Key in the distance value of the measurement table, value is divided into 32 steps.
- **GA** Set the GA result value corresponds to each distance.
- **Save** Click it, and in the pop-up input dialog box, input the name of the new formula. Click Save to save the new formula and exit; The system will add one “U” before the new formula name automatically, which means that it is user defined;
- **Exit** Click to exit Measure Setting.
- **Del Formula** Delete the selected formula;

NOTE:

Only the user-defined formula can be deleted.

3.4.3.5 Comment Setting

In **System Setting** page, click [Comment Setting] to go to Comment Setting page. Click [Exit] to exit Comment Setting. Comment Setting page is shown below:

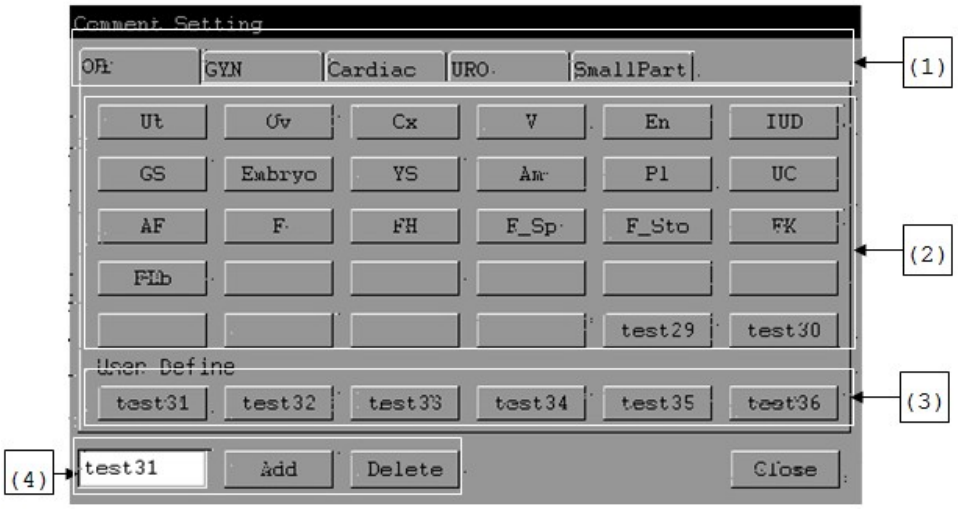


Fig. 3.4.3.5 Comment Setting page

The Comment Setting page can be divided into the following areas:

(1) Application select area;

(2) System predefined comment area;

(3) User Define comment area, each application have 6 additional user-defined annotations;

(4) User defines comment operation area.

In Comment Setting, different measurement parts are displayed in screens, but the operation methods are consistent.

Here is an instruction on how to use the User Define comment:

- **Select** Click any of the buttons in User Define comment display area, and the user defined comment for that button will be displayed in the input box.
- **Input** Use the keyboard to input new user defined comments.
- **Add** Click add, and the user defined comment is added to the user defined comment display area.
- **Del** Click Del, the selected user-defined comment is deleted from the user defined comment display area.

● How to use Comment

In an exam mode, press the【Comment】 key to active the comment screen. Click [Exit], or press the【Comment】key again to exit adding comments.

When adding a comment, the user may follow the steps:

- **Start to comment** Press the【Comment】key key, and the cursor will change to "|"shape to mean that it is now in the comment state;
- **Confirm position** Move the cursor to the position to add the comment. Press the【SET】key to confirm the position. The cursor will changes to "|", which means that it is ready to input comment. Manual input and Auto input
- **Manual input** Input the comment from the keyboard, numbers and letters can be inputted; With the【Caps Lock】key, the user can switch between upper and lower cases of letters; By press the【Shift】+【Space】key, user can switch to the Chinese characters input state. After the input, press the【Enter】key to confirm.

◆ **Auto input** In comment state, press the【Esc】key, an auto input adding page will be shown. Select the desired comment, press the 【SET】key, the comment will be added. Then the user may continue to input another comment.

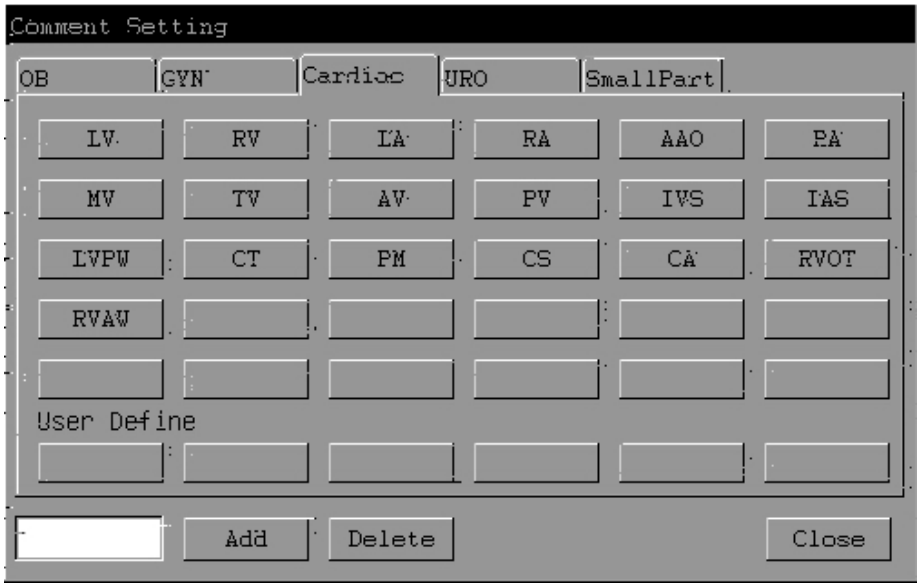


Fig. 3.4.3.5-b Comment Setting page

◆ **Move the comment** Move the cursor to comment, the cursor changes to "✥", which means that the comment is moveable. Press the【SET】key to select the comment, now a box is enclosed around the comment, which means that the comment can be moved with trackball movement. Move the trackball to the target position. Press the 【SET】key, and the comment is moved to a new position.

◆ **Delete a comment** Select a comment, press the【Backspace】key to delete the selected comment. Press the【Clear】to clear all the inputted comments.

3.4.4 Patient Information

Press the【Patient】key, active the Patient Information page.

Click Save, save the current Patient Information; click [Exit], or press the 【Patient】key again, it will exit without saving the current information.

The Patient Information page is shown below:

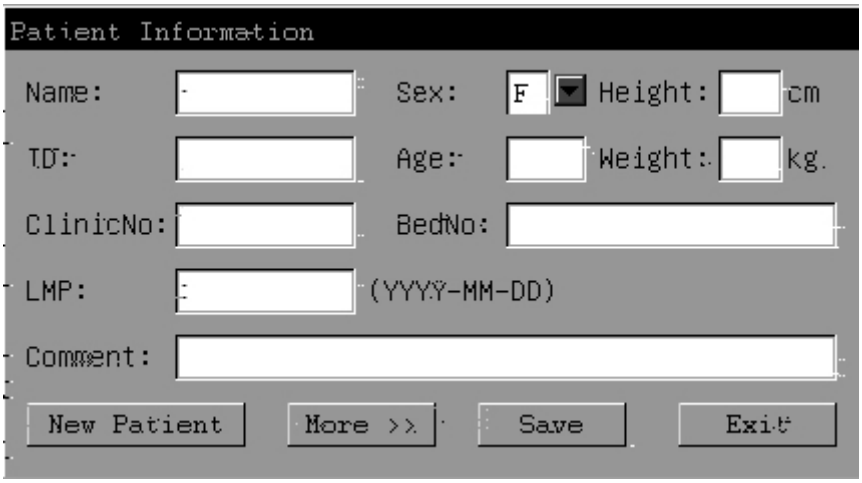


Fig. 3.4.4 Patient Information page

The setting items and setting method of Patient Information page are shown below:

- **Name** Input from the keyboard. 5 Chinese characters or 10 english letters.
- **Sex** Male or female can be selected by com-box.
- **Height** Input from the keyboard. 3 numbers, in the unit of cm.
- **ID** Input from the keyboard. Patient ID, 10 letters or numbers.
- **Age** Input from the keyboard. 3 numbers.
- **Weight** Input from the keyboard. 3 numbers, in the unit of kg.
- **ClinicNo** Input from the keyboard. Clinical number, 10 letters or numbers.

- **BedNo** Input from the keyboard. Bed number, 10 letters or numbers.
- **LMP** Input the last menstrual period of the patient by the keyboard.
- **Comment** Input from the keyboard. 40 Chinese characters or 80 English letters.
- **New Patient** All the information of the current patient will be cleared when new patient data input, including the report for the performed measurement.
- **More** The Patient Information page will be extended, which includes: Tel, Address, Memo. Click it again to go back to the initial Patient
- **Tel** Input by the keyboard.
- **Add** Input by the keyboard.
- **Memo** **Input by the keyboard.**

3.4.3.6 Disk Management

Disk Management function is to manage files and directories on the system disk or external USB disk.

Press the 【File】key, or in [System Setting] page, click [Disk Management], active Disk Management page.

Press the【File】key again, or click [Exit] to exit Disk Management page.

Disk Management page is shown below:

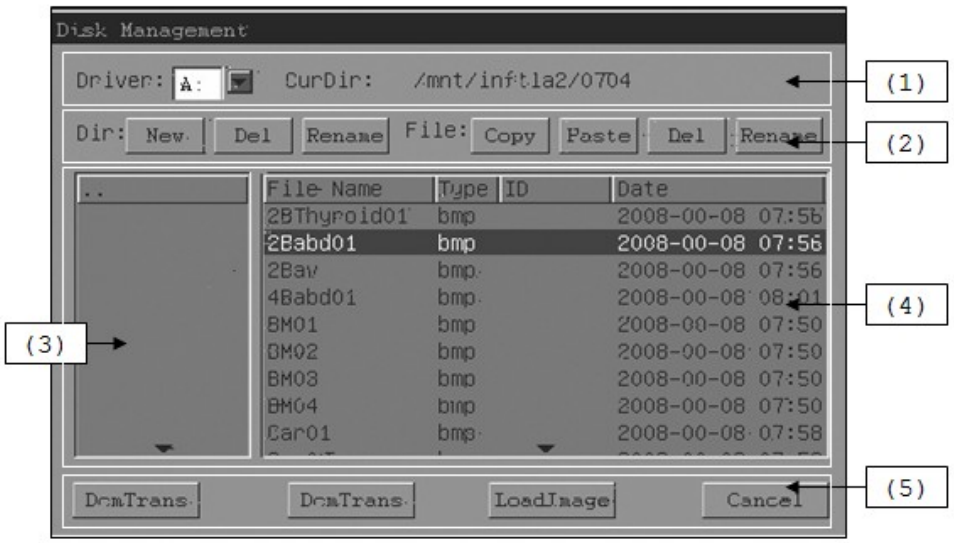


Fig. 3.4.3.2-a Disk Management page

Disk Management screen is divided into:

(1) Driver and current path display area;

(2) Directory and file operation select area;

(3) Directory display area for the current path;

(4) File display area for the current path;

(5) Other operations.

The operation of Disk Management is described below:

Drive　drop down frame selection，A is the system disk；B、C is the external U disk.

- **Dir (Directory)**

The Dir is only valid for an external USB disk. The user shall select the USB disk (Driver B, C) from the driver com-box, and on the left of the file manager it displays the USB disk directory.

- ◆ **..**　　Click '.' to go to the upper level directory.

- **Subdirectory** Click to select the target directory; Click it again to select the directory, and it goes into that directory. Select the target directory, and then click the operation item:
- **New** To create a new directory. In the pop-up input dialog box, input the name of a new directory. Click Ok to confirm;
- **Copy** To copy a directory and get ready for Paste
- **Paste** To paste a directory, the Paste operation is invalid for the system disk
- **Del** To delete a directory. There will be a confirm dialog box.
- **Rename** To rename a directory. In the pop-up input confirm dialog box,input the name of a new directory. Click Ok to confirm.

NOTE:

If a repeated directory name is displayed when performing New or Rename, it will prompt that such operation fails.

- **File**

Part of the File operation, the Copy, Del and Rename operations are all valid for system disk and the USB disk. Paste works for the USB disk only. The user shall select the USB disk (Driver, C) from the driver drop-down box, and on the right of the file manager it displays all the files under the current directory. Select the target file, and then click any of the items under File:

- **Copy** To copy a file, copy the target file to the buffer area and get ready for Paste.
- **Paste** To paste a file (before to paste, change the current directory to paste the file), paste the file in the buffer area to the current directory, and clear the buffer area. In the system disk, the Paste operation is invalid.
- **Del** To delete a file, In the pop-up confirm dialog box, click Ok to confirm and complete the deletion of a target file;
- **Rename** To rename a file, in the pop-up input confirm dialog box, input the name of a new directory. Click Ok to confirm.

If the inputted file name already exists, it will prompt operation fails. If the inputted file name already exists when performing Paste, it will prompt whether to overwrite or not.

- **Others**

  - **DICOM Trans** If the system has DICOM function, it will select to transfer files in DICOM format.
  - **Load** To load the selected file (image or report) to the system.
  - **Burning Files** To go to the burning file page.

    Click [Burning Files] in [Disk Management] page, and it goes to Burning Files page. Click [Exit] to exit Burning Files page.

Burning Files page is shown below:

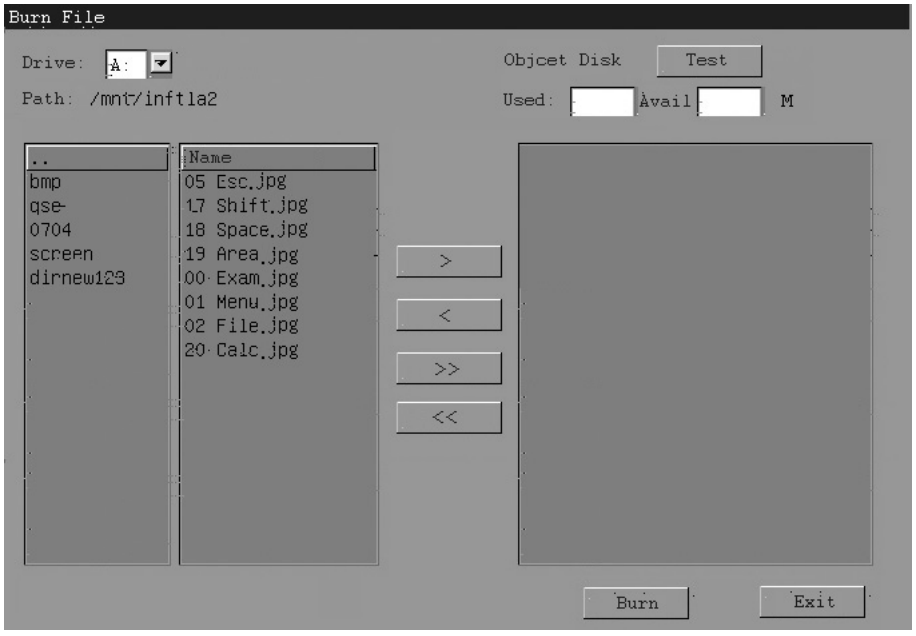


Fig. 3.4.3.2-b Burning Files screen

The instruction for performing Burning Files is described below:

- **Test** Insert a CD, click Test, and it displays the CD information and the capacity available.
- **>/>>** To add a file; Select the target file, click'>', to add one file to Burning Files buffer area; click'>>', to add all the files in the current directory to the Burning Files buffer area. The percentage of the Burning Files buffer area capacity to the whole CD capacity is prompted in Used and Available display area. The total size of the selected files shall not exceed the capacity of the CD.
- **</<<** To delete a file. Select one file from the Burning Files buffer area, click'<', and the selected file is deleted from the Burning Files buffer area; click'<<', and all the content in the Burning Files buffer area sis deleted.
- **Burning Files** Click it to start Burning Files operation. After Burning Files is finished, the system will prompt "Success". For the user, Burning Files enables auto continuing burning without inserting a new CD every time.

3.4.3.7 LCD Setting

In **System Setting** page, click [LCD Setting] to LCD Setting page. Click [Ok],it will exit and save the current setting; click [Cancel], it will exit without saving the setting info. LCD Setting page is shown below:

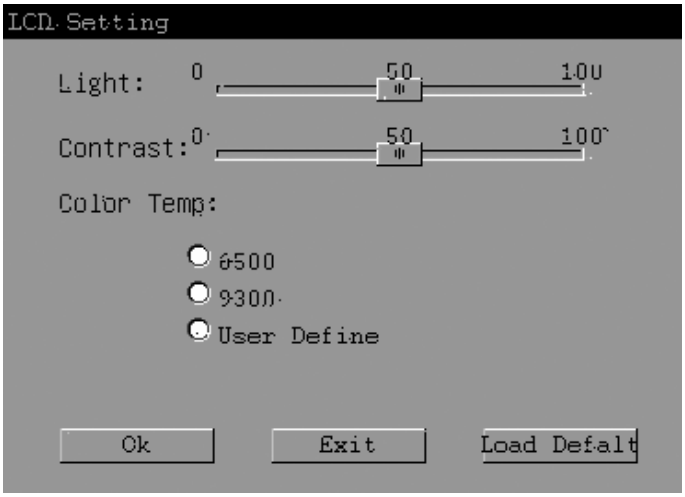


Fig. 3.4.3.3-a LCD Setting page

The setting items of LCD Setting are described below:

- **Brightness** Press the【Trackball】+【SET】key to select brightness slider position.
- **Default** To export the factory default LCD Setting.

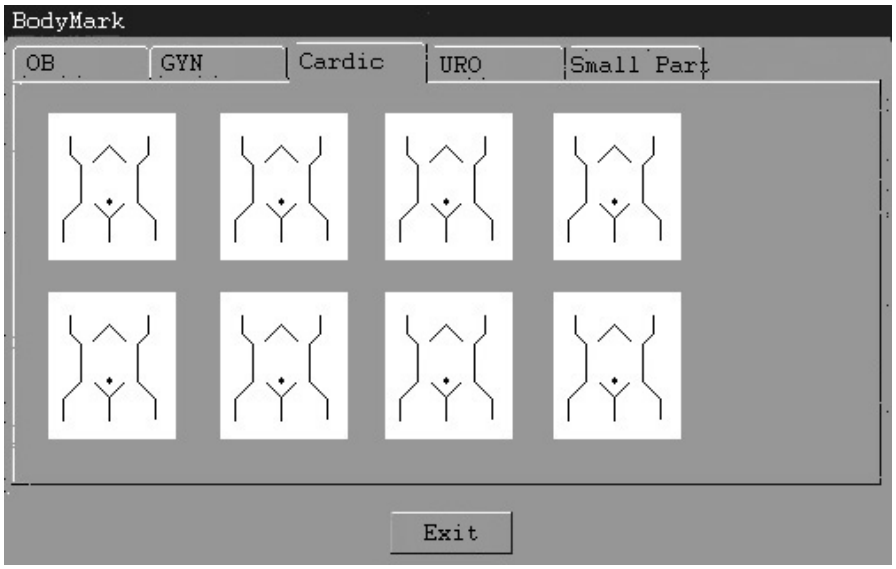
3.4.5 BodyMark

Press the【BodyMark】key to active the BodyMark page.

Select the desired bodymark and exit BodyMark page;

Click Exit, or press the【BodyMark】 key again to exit BodyMark screen.

The BodyMark page is shown below:



The operation of BodyMark is follows:

- **Add** Go to BodyMark page, click a bodymark, and the selected bodymark appears at the left-bottom of the image area; Move the 【Trackball】to adjust the probe position in the bodymark; Rotate the【MENU】key to adjust the probe orientation in the bodymark; Press the 【SET】key to fix the probe orientation. Note: To insert a new bodymark will clear the original bodymark.

- **Move** Move the trackball cursor to the bodymark, and the cursor changes to " ", which means that bodymark is moveable. Press the【SET】key to select the bodymark. Now a box is enclosed around the bodymark, which means that the bodymark can be moved with trackball movement. Move the trackball to the target position, press the【SET】key to move the bodymark to the new position.
- **Del** Go to BodyMark page, click Exit, or press the【BodyMark】key to exit BodyMark page and clear the added bodymark.

3.4.6 How to use biopsy

In [image menu], click [Biospy] item; When biospy is in 'on' state, the parameters of Position and Angle will display. Meanwhile the biopsy guide line is displayed in the imaging area.

The control menu of Biospy is shown below:

Fig. 3.4.6 Biospy control menu

The setting method for Biospy menu is shown below:

- **Position** Translate the biopsy, -10mm ~ +10mm selectable. Press the【SET】key to increment, or press the【SET】key to decrement; or rotate the【MENU】knob to increment or decrement, 1mm each step.
- **Angle** Biospy angle, -10° ~ +10° selectable. Press the【SET】key to increment, or press the【SET】key to decrement; Or rotate the 【MENU】knob to increment or decrement, 1° each step.

3.4.7 Report

In frozen mode, press the【Report】key to active Report page. Click [Exit], or press the【Report】key again to exit Report page.

The Report page is shown below:

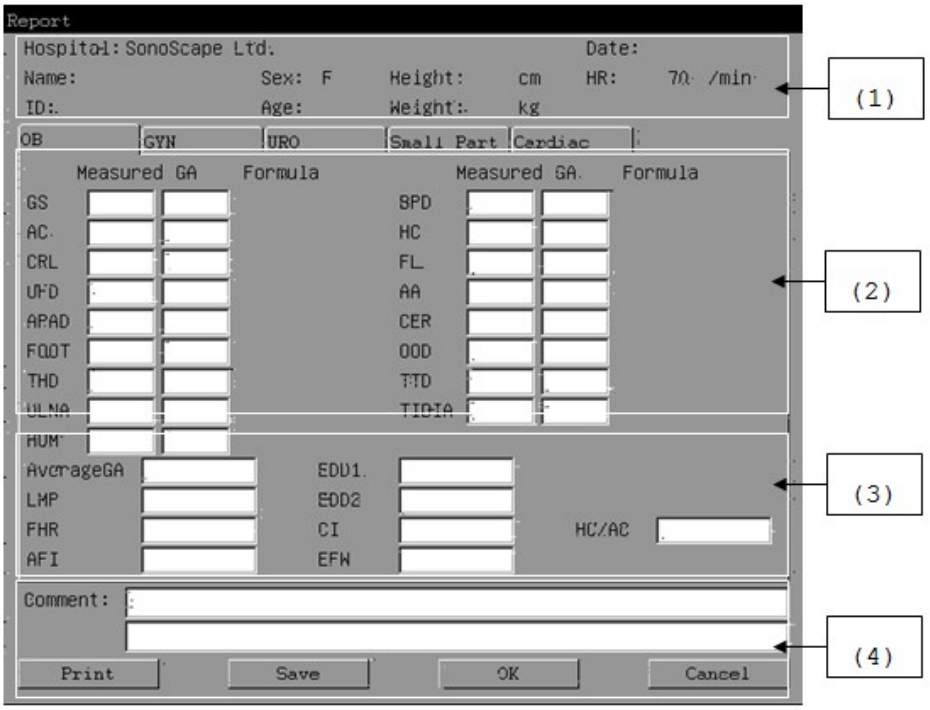


Fig. 3.4.8 Report management page

The Report screen is divided into:

(1) Patient basic information area

(2) Measurement information area

(3) Calculation result information area

(4) Exam and other operation area

The operation of Report is shown below:

- **Change** The user may change measurement value in the measurement information area.

NOTE:

Many relevant numbers will be changed in the report automatically.

- **Print** Click it and the report content will be printed out .
- **Save** Click it. In the pop-up input dialog box, input a new report name, and the system will add a default extend file name ".rpt". Click OK to save the new report and exit the Report page; When the report is saved, the user may manage, review, recall, change or print in the Disk Management.
- **OK** Click it to save the change of current report.

3.4.8 Use the peripherals

3.4.8.1 USB device

The system adopts general USB ports to connect to peripheral devices. The selectable peripheral devices include: USB disk, mobile hard drive, USB printer, USB CD writer, USB mouse, etc.

NOTE:

Due to the fact that there are many brands and models of such devices, to ensure the normal functioning of the peripheral devices, please try to use the recommended models by the manufacturer.

The operation method for USB peripherals is follows:

- **USB disk** When a USB disk is plugged in, the status prompt area will displays a icon. Before plug out the disk, click the icon. In the uninstall USB disk dialog, click OK to uninstall the USB disk, and the icon disappears;

NOTE:

The USB disk can only be removed when it is uninstalled！To remove the USB disk by force during operation will damage the system files, destroy the user data, or even lead to system failure to initialize！

- **USB printer**

  When a system supported USB printer is plugged in, the status prompt area will displays a icon; Press the 【Print】key, and a print dialog is displayed. Adjust the report format, click OK to print

- **USB CDRW**

  When a system supported USB CD writer is plugged in, and when it is properly connected to the system, active Burning Files page to perform burning. See Section **3.4.3.2 Disk Management** on how to perform burning;

3.4.8.2 Footswitch

Connect the special footswitch accessory to the real panel.

3.4.8.3 Video Out

The system video output format includes: VGA, S-video, composite video (NTSC/PAL);

Composite video is TV signals. It can be connected to all kinds of TV monitors. There are 2 major TV formats used worldwide: NTSC and PAL, the user may select the local format in System Setting; when it is connected to a composite video printer, connect the video signal cable and the remote control cable to the rear panel of the main unit, use the Print key on the main unit keyboard to achieve printing through a remote control video printer;

3.4.8.4 Network Device

Through the standard net port, the main unit can be connected to a DICOM system. See Section 3.4.3.1 for the detailed operation;

3.5 Imaging

3.5.1 Basic operation

The system supports many image modes such as B, B/B, 4B, B/M, M, and THI. Here is the operation:

- **B mode** press the【B】key to switch to B mode.
- **2B mode** press the 【Dual B】key to switch to dual B mode, the left image is alive. Press the 【Dual B】 key again, and it alternate between left and right image. The current live image is indicated by a triangle below.
- **4B mode** press the【Quad B】key to switch to 4B mode, press the【Quad B】key again, and it activate the upper left, upper right, bottom left, bottom right image by turn, The current live image is indicated by a triangle below.
- **B/M mode** press the【B/M mode】key to switch to B/M mode, press the【B/M mode】key again to switch to full M mode. The display method for M mode, B/M mode, B/M mode can be set up in System Setting.
- **THI mode** press the【THI】key to switch to THI (Tissue Harmonic Imaging) mode, press THI again to exit.
- **Vertical invert** Press the 【Up/Down】 key to invert the current active image vertically, and the small dot marking the image orientation is inverted as well.
- **Horizontal invert** Press the【L/R】key to invert the current active image horizontally, and the small dot marking the image orientation is inverted as well.

3.5.2 Parameter Adjust

For the system, the adjustable imaging parameters include:

- **Focus** The transmit focus numbers can be selected: 1~4.
- **Depth** To select transmit focus depth position.
- **DYN** To select system dynamic range, 10 steps selectable.
- **GSC** To select grayscale curve, 16 curves selectable.
- **Enhance** To enhance image edge, 8 steps selectable.
- **Persist** Persistence processing, 8 steps selectable.
- **Line Density** To select scan line density, High/Low, and the default is High.
- **SPAN** To select scan angle/width.
- **Biospy** To set up biopsy setting, and the default is OFF; if it is set ON, two lines of indented menu are displayed:
  Position Biospy translate -10 ~ +10mm selectable, the increment is 1mm.
  Angle Biopsy angle-10~+10° selectable, the increment is 1°.
- **Freq** To select multiple frequencies, 5 steps selectable.
- **Rotate** To select B mode image orientation, which corresponds to 0°, 90°, 180°, 270°.
- **Chroma** To select the chroma code for the ultrasound image;
- **Power** To select acoustic power, 8 steps.
- **ZOOM** To activate image zoom function.
- **Gain** To adjust image gain in B or M mode.
- **TGC** 8-step TGC, to adjust image depth compensation gain. The adjusted parameter curve is displayed in the TGC curve display area, which disappears automatically in 3 seconds.

Image	
PTN	3
Depth	3
DYN	1
GSC	1
ENH	2
LD	Low
SPAN	1
Biospy	Off
Freq	4.0
Turn	1

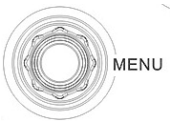
Fig. 3-5-2 Image Menu

The operation of special knobs is follows:

Image display depth, focus position, image zoom function. Press the【FUNC】key, in turn it activates image display depth, focus position, image zoom function, the current function state is displayed in the system prompt area. Rotate the【FUNC】knob to adjust focus position and image depth. image For Zoom adjust, use the trackball and the 【SET】key, and the specific steps are shown below;

Press the【FUNC】key, select image zoom function; now in the image area it displays box, which means that it is a region that can be zoomed in. Rotate the【FUNC】knob to select the required zoom factor, now the size of the box changes; Move the trackball to to region to be zoomed in, press the【SET】key to go to zoom mode. Then rotate the 【FUNC】knob to change the current image zoom factor; If the zoom factor is less than 1.0, the system is displayed full ; in zoom mode, press the【FUNC】key again or ESC, it will exit the zoom mode, and the image returns to normal mode.

B mode, M mode image gain adjust. Rotate the【GAIN】knob to perform image gain adjust; in B/M mode, press the【FUNC】key to switch between B-gain and M-gain. In freeze mode, adjust the the【FUNC】knob will change the LCD brightness.



To adjust the selected parameter in the image menu. In live imaging mode, press the 【MENU】key to activate or exit mage adjust menu. In the image menu, use the cursor to select the parameter item, and that item is highlighted. Rotate the【MENU】knob to adjust that parameter. In exam mode screen, press the【MENU】key to activate System Setting menu.

3.6 Measurement

The frame of measurement menu in B mode is as shown in Fig. 3.6.1.

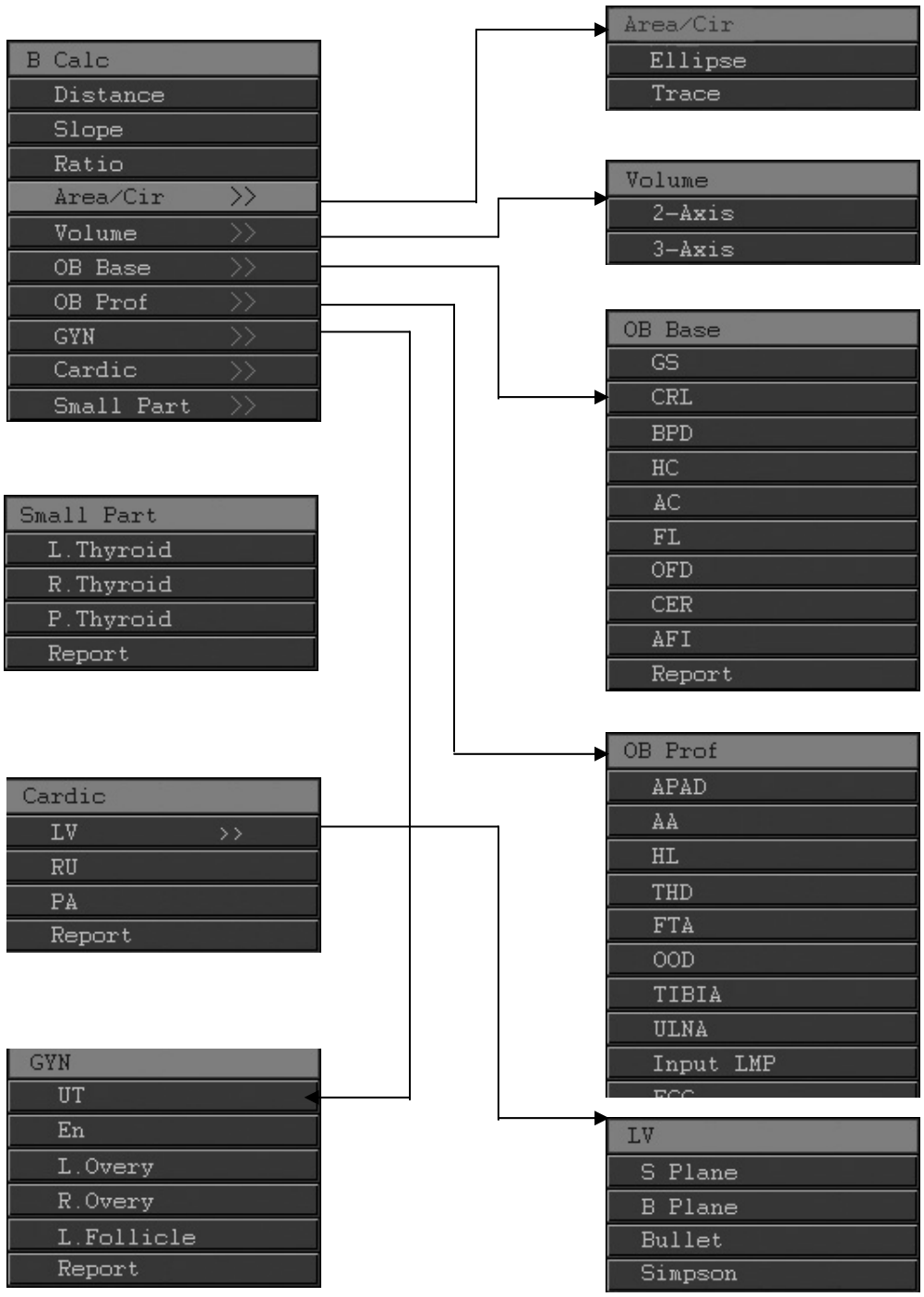


Fig. 3.6.1 B mode measurement menu

The system has included many measurement formulas and forms. Due to differences in race characteristics worldwide, the user may select an appropriate formula to perform measurement based on local race data, or to input local race data in the form of user-defined data tabulation. See **Section 3.4.3.4 Measure Setting** for details;

3.6.1 B mode basic measurement

Basic measurement includes:

Distance measurement

Angle measurement

Ratio measurement (distance ratio, area ratio)

Area/Cir measurement (Ellipse, Trace)

Volume measurement (2-Axis, 3-Axis)

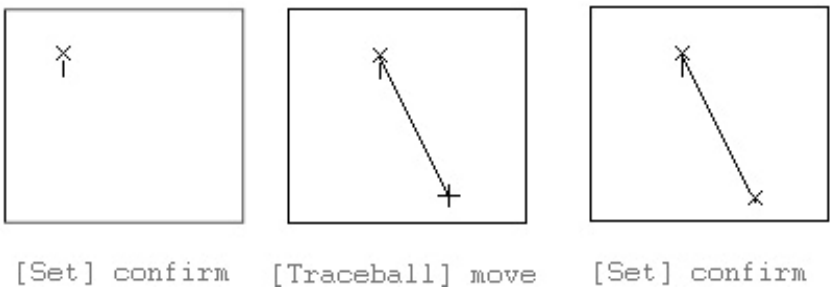
3.6.1.1 Distance Measurement

Function: Distance Measurement will measure the distance between 2 points.

Measurement method:

1. In B mode frozen state, press the【Distance】key to go to distance measure mode, or press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Distance “ , press the 【SET】key to go to distance measure mode.
2. The cursor in the image area is displayed as a “+”, Use the trackball to shift the cursor to the measurement start point , press the 【SET】key, and it will display a fix mark “ X”, and it displays the measurement ruler number as the current one.
3. Use the trackball to move the cursor, the cursor “+” and the the start point are connected by a dotted line between the marks “X”. In the result window it displays the live measurement value.

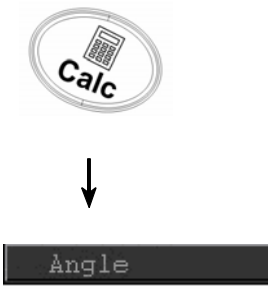
4. Use the trackball to shift the cursor “+” to the measured end point, press the 【SET】key, on the measurement end point it displays the fix mark “X”, the measurement result is fixed, and it ends the measurement.
5. Repeat steps 2~4 to go to the next Distance Measurement.



3.6.1.2 Angle measurement

Function: To measure the inclination angle between 2 straight lines (0~180°).

Measurement method:



1. In B mode frozen state, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Angle”, press the 【SET】key to go to angle measurement mode.
2. Draw a section along one side of the measurement angle. See “Distance Measurement” for the measurement method.
3. Draw a section along the other side of the measurement angle. See “Distance Measurement” for the measurement method. The inclination between the two sections and the length of the sections are displayed in the result window.
4. Repeat steps 2 to 3 to perform the next measurement.

3.6.1.3 Ratio measurement

Ratio measurement includes distance ratio and area ratio.

A. Distance ratio

Function: To measure and calculate the ratio of two distance measurement values. The first measured value is the numerator, and the next measured value is the denominator.

Measurement method:

1. In B mode frozen state, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Ratio”, press the 【SET】key to go to Ratio measurement mode.
2. Measure the first distance. The measurement method is the same as “Distance Measurement”.
3. Measure the second distance. Move the cursor to the image window area, and the cursor is displayed as a “+”. Use the trackball to shift the cursor to measurement the start point, press the 【SET】key, and on the measure start point it displays the fix mark “x”. Use the trackball to move the cursor, between “+” and “x” there is a connecting dotted line. In the result window it displays measurement value and calculation result in real-time.
4. Press the 【SET】key, the measurement ends, and the section length and “Ratio” calculation result is displayed in the result window.
5. Repeat steps 2 to 4 to perform the next measurement.

B. Area ratio

Function: To measure and calculate the ratio of two area measurement values. The first measured value is the numerator, and the next measured value is the denominator.Use the Ellipse method to perform the area measurement, for the Ellipse method,see the section 3.6.1.4 for detail.

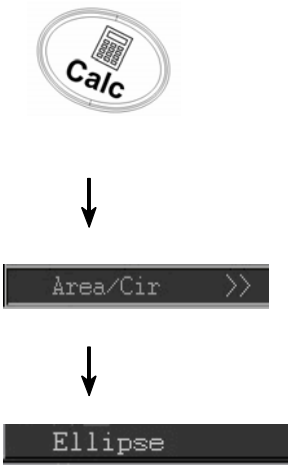
3.6.1.4 Area/Circumference measurement (Ellipse, Trace)

Area/Circumference measurement includes Ellipse and Trace.

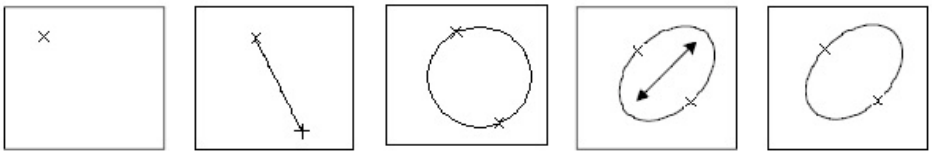
A. Ellipse

Function: Use an approximate ellipse to measure circumference and area of an enclosed region.

Measurement method:



1. In B mode frozen state, press the【Calc】key to pop up the Meas & Calc menu. Move the trackball, use the cursor to select “Area/Cir”, press the 【SET】key to go to the submenu. Select “Ellipse”, press the 【SET】key to go to “Ellipse” measurement mode.
2. Move the cursor to the start point of the fixing axis of the ellipse measurement area. Press the 【SET】key, and on the start point of the fixing axis it displays the mark “+”.
3. Move the cursor to the end point of the fixing axis of the ellipse measurement area. Between the cursor “+” and “x” there is a connecting dotted line. Press the 【SET】key, on the end point of the fixing axis, it displays the mark “x”, and on the screen it displays an ellipse.
4. Move the trackball to adjust the variable axis length of the ellipse to match the ellipse with the measured region. Move the trackball leftward, and the variable ellipse axis is getting small, Move the trackball rightward, and the variable ellipse axis is getting bigger.
5. Press the【SET】key to confirm the ellipse measurement area, and the result is displayed in the result window, and it ends the measurement.
6. Repeat steps 2 to 5 to perform the next measurement.



a: Press Set to confirm the start point of the ellipse axis

b: Move the【Trackball】to shift the cursor to the end point of the ellipse axis

c: Press the【SET】key to confirm the end point of the ellipse axis

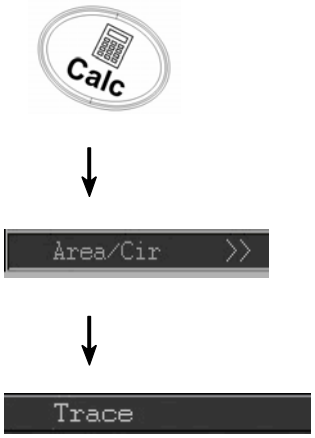
d: Move the【Trackball】 to select the ellipse area

e: Press the【SET】key to confirm the ellipse area

B．Trace

Function: Use Trace measurement to measure circumference and area of an enclosed region.

Measurement method:



1. In B mode frozen state, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Area/Cir”, press the 【SET】key to go to the submenu to select “Trace”. Press the【SET】key to go to “Trace” measurement mode.
2. Move the cursor to the measurement start point , press the【SET】key, on the measurement start point it displays the fix mark “ x”.
3. Move the trackball to enable the cursor to move along the edge of the target area, and a trace is drawn.
4. Press the【SET】key, and the trackball start point and the end point are enclosed by a straight line; or when the cursor and the trace start point distance are very close, the trace is enclosed automatically. The measurement result is displayed in the result window, and it ends the measurement.
5. Repeat steps 2 to 4 to perform the next measurement.

NOTE:

Always avoid any intersection of trace when performing Ttrace method, so as to prevent calculation error.

3.6.1.5 Volume measurement (2-Axis, 3-Axis)

Volume measurement consists of 2-Axis and 3-Axis.

A. 2-Axis

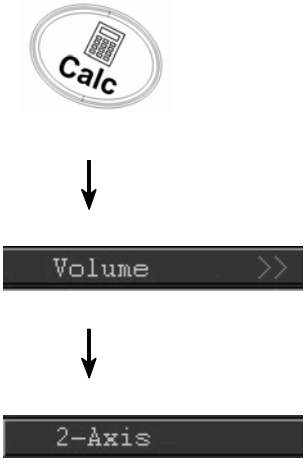
Function: Based on the perpendicular section of the measured object, to calculate the volume of the measured object.

Principle: Formula for 2-Axis:

$$V = (\pi/6) \times A \times B^2$$

Where A is the long axis of the ellipse, and B is the short axis of the ellipse.

Measurement method:



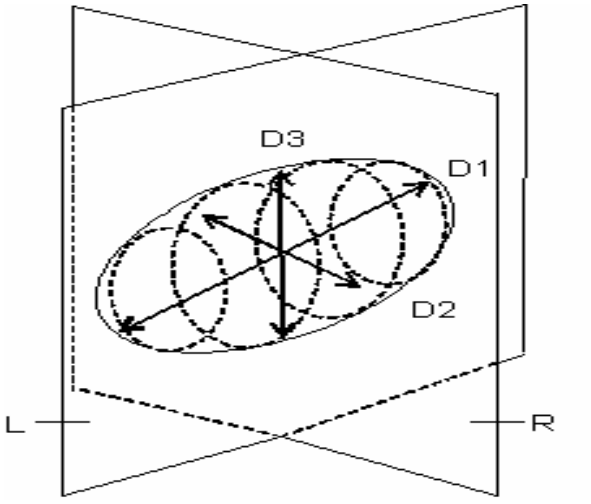
1. In B mode frozen state, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “volume”, press the【SET】key to go to the submenu, move the trackball to select “2-Axis”, press the【SET】key to go to “2-Axis volume” measurement mode.
2. Move the cursor to the start point of the fixing axis of the ellipse measurement area. Press the【SET】key, and on the fixing axis start point , it displays a mark “+”.
3. Move the cursor to the end point of the fixing axis of the ellipse measurement area. Between the cursor “+” and “x” there is a connecting dotted line. Press the【SET】key, on the fixing axis end point it displays the mark “x”, and on the screen it displays an ellipse.

4. Move the trackball to adjust the variable axis length of the ellipse to match the ellipse with the measured region. Move the trackball leftward, and the variable ellipse axis is getting small, Move the trackball rightward, and the variable ellipse axis is getting bigger.
5. Press the【SET】key to confirm the ellipse measurement area, and the result is displayed in the result window, and it ends the measurement.
6. Repeat steps 2 to 5 to perform the next measurement.

B．3-Axis

Function: Based on the vertical section and the horizontal section of the measured object, the object volume is calculated.

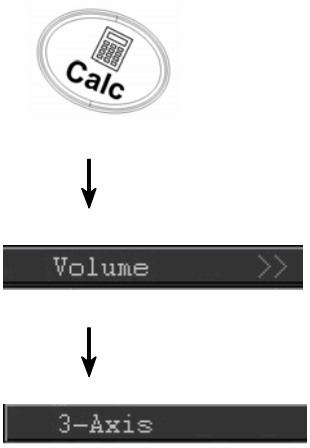
Principle: The volume can be estimated from the orthogonal D1, D2 and D3 values of the object.



The formula:

$$V = (\pi/6) \times D1 \times D2 \times D3$$

Measurement method:



1. In B mode, scan and freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “volume”, press the【SET】key to go to the submenu, move the trackball to select “3-Axis”, go to “3-Axis volume” measurement mode.
2. On the screen based on the size of the measured region an ellipse is drawn. See “Area/Cir” with ellipse for the ellipse drawing method.
3. Unfreeze the image; rescan to acquire a section orthogonal to the previous image. Freeze it, and measure the length of the 3rd axis. The measurement method is the same as that for “Distance Measurement”.
4. After ending the measurement, the measurement result for volume is displayed in the result window.
5. Repeat steps 2 to 4, to go to the next 3-Axis volume measurement.

3.6.2 B mode special measurement

B mode special measurement includes:

Basic OB measurement

Applicable OB measurement

GYN measurement

Cardiac measurement

Urologic measurement

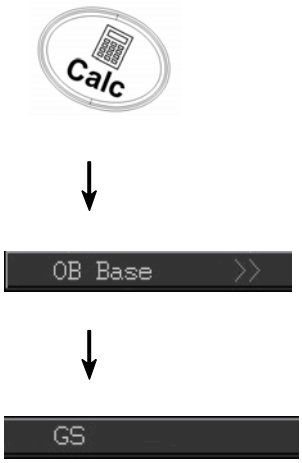
Small Part measurement

3.6.2.1 Basic OB measurement

3.6.2.1.1 GS (Gestational Sac) measurement

Function: Calculate GA (gestational age) based on GS.

Measurement method:

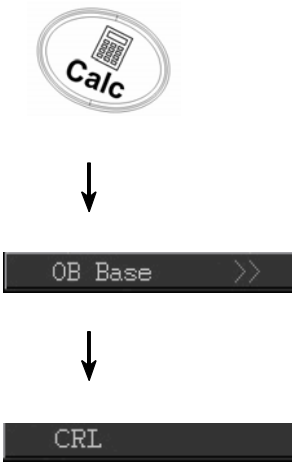


1. In B mode frozen state, press the【Calc】key to pop up the Meas & Calc menu. Move the trackball; use the cursor to select “OB Basic”. Press the【SET】key to go to the submenu. Move the trackball to select “GS”. Press the【SET】key to go to “GS” measurement mode.
2. Measure GS. See “Distance Measurement” for the detailed method.
3. The GS measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next GS measurement.

3.6.2.1.2 CRL (Crown Rump Length) measurement

Function: Calculate GA based on CRL.

Measurement method:

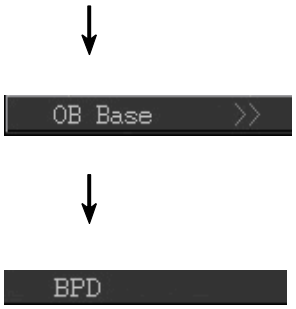


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “CRL”, press the【SET】key to go to “CRL” measurement mode.
2. Measure CRL. See “Distance Measurement” for the detailed method.
3. CRL measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next CRL measurement.

3.6.2.1.3 BPD (Biparietal Distance) measurement

Function: When the fetus is between 12 to 20 weeks, calculate GA based on BPD.

Measurement method:

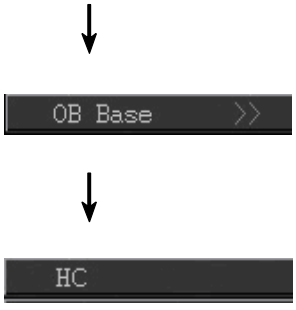


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “BPD”, press the【SET】key to go to “BPD” measurement mode.
2. Measure BPD. See “Distance Measurement” for the detailed method.
3. BPD measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next BPD measurement.

3.6.2.1.4 HC (Head Circumference) measurement

Function: Calculate GA based on HC.

Measurement method:

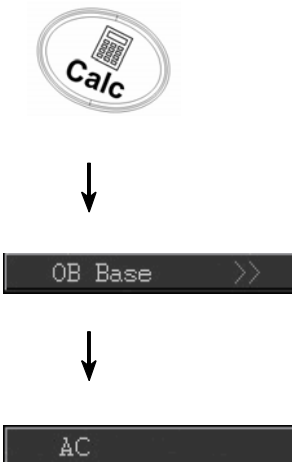


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “HC”, press the【SET】key to go to “HC” measurement mode.
2. Measure HC. See “Distance Measurement” for the detailed method.
3. HC measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next HC measurement.

3.6.2.1.5 AC (Abdominal Circumference) measurement

Function: Calculate GA based on AC.

Measurement method:

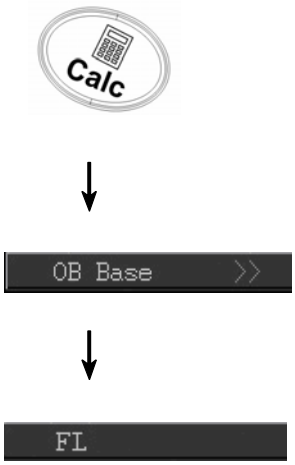


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “AC”, press the【SET】key to go to “AC” measurement mode.
2. Measure AC. See “Distance Measurement” for the detailed method.
3. AC measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1to 3 to go to the next AC measurement.

3.6.2.1.6 FL (Femur Length) measurement

Function: Calculate GA based on FL.

Measurement method:

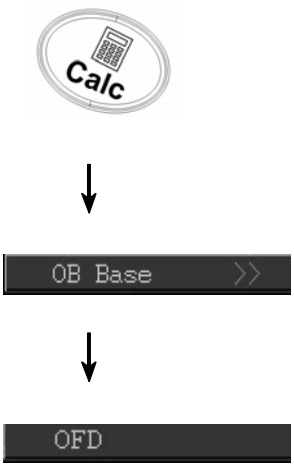


1. In B mode, scan and freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Basic OB”, press the【SET】key to go to the submenu, move the trackball to select “FL”, press the【SET】key to go to “AC” measurement mode.
2. Measure FL. See “Distance Measurement” for the detailed method.
3. FL measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next FL measurement.

3.6.2.1.7 OFD (Occipitofrontal Diameter) measurement

Function: Only when it is difficult to measure BPD correctly, calculate GA based on OFD.

Measurement method:

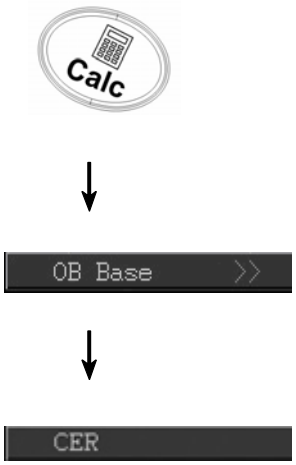


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “OFD”, press the【SET】key to go to “OFD” measurement mode.
2. Measure OFD. See “Distance Measurement” for the detailed method.
3. OFD measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next OFD measurement.

3.6.2.1.8 CER measurement

Function: Calculate GA based on FT

Measurement method:



1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “CER”, press the【SET】key y to go to “CER” measurement mode.
2. Measure CER. See “Distance Measurement” for the detailed method.
3. CER measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next CER measurement.

3.6.2.1.9 AFI (Amniotic Fluid Index) measurement

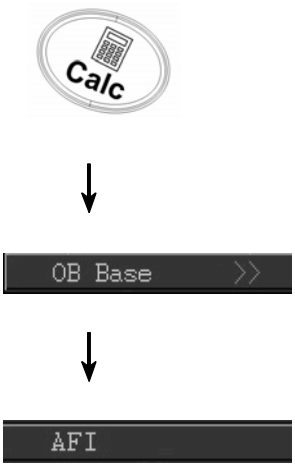
Function: Evaluate the fetal status based on AFI.

Measurement the formula:

AFI=AFD1 (depth1) + AFD2 (depth2) + AFD3 (depth3) + AFD4 (depth4)

AFD1, AFD2, AFD3, AFD4 refer to amniotic fluid depths in 4 parts.

Measurement method:



1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Basic”, press the【SET】key to go to the submenu, move the trackball to select “AFI”, press the【SET】key to go to “AFI” measurement mode.
2. Measure AFD1. See “Distance Measurement” for the detailed method.
3. Unfreeze the image, rescan the image, freeze, measure AFD2, the measurement method is the same as “Distance Measurement”.
4. Unfreeze the image, rescan the image, freeze, measure AFD3, the measurement method is the same as “Distance Measurement”.
5. Unfreeze the image, rescan the image, freeze, measure AFD4, the measurement method is the same as “Distance Measurement”.
6. The amniotic fluid depths in 4 parts are calculated, and the AFI result is displayed in the result window.
7. Repeat steps (1) to (6) to go to the next AFI measurement.

3.6.2.1.10 Report

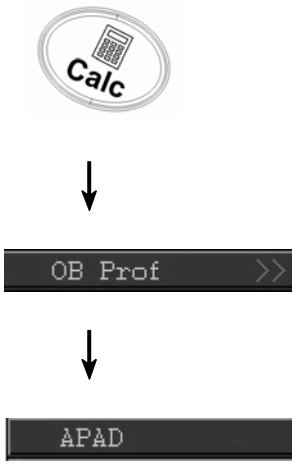
See **“3.4.8 Report”.**

3.6.2.2 High-level OB measurement

3.6.2.2.1 APAD measurement

Function: Calculate GA based on APAD.

Measurement method:

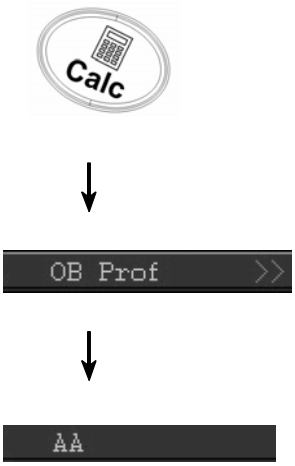


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “APAD”, press the【SET】key to go to “APAD” measurement mode.
2. Measure APAD. See “Distance Measurement” for the detailed method.
3. APAD measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps (1) to (3) to go to the next APAD measurement.

3.6.2.2.2 AA (Abdominal Area) measurement

Function: Calculate GA based on AA.

Measurement method:

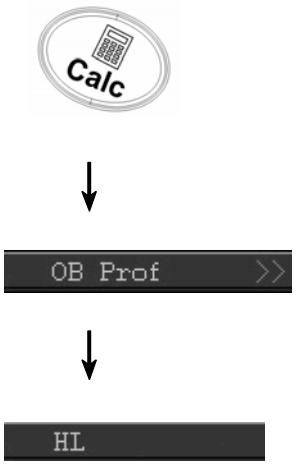


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “AA”, press the【SET】key to go to “AA” measurement mode.
2. Measure AA; see “Area/Cir measurement (Ellipse) “for the detailed method.
3. AA measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next AA measurement.

3.6.2.2.3 HL (Humerus Length) measurement

Function: Calculate GA based on HL.

Measurement method:

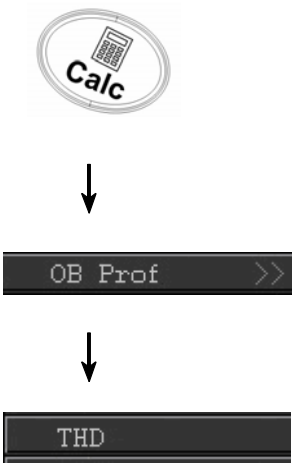


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “HL”, press the【SET】key to go to “HL” measurement mode.
2. Measure HL. See “Distance Measurement” for the detailed method.
3. HL measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next HL measurement.

3.6.2.2.4 THD（Thoracic Diameter）measurement

Function: Calculate GA based on THD.

Measurement method:

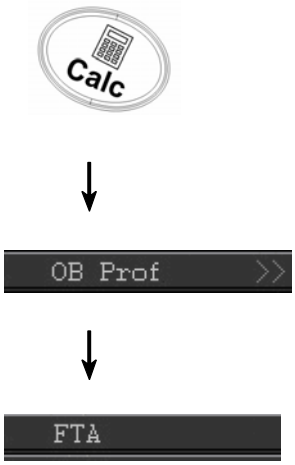


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “THD”, press the【SET】key to go to “THD” measurement mode.
2. Measure THD. See “Distance Measurement” for the detailed method.
3. THD measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next THD measurement.

3.6.2.2.5 FTA (Fetal Trunk Area) measurement

Function: Calculate GA based on FTA.

Measurement method:

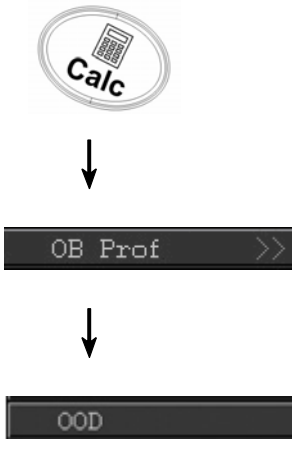


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “FTA”, press the【SET】key to go to “FTA” measurement mode.
2. Measure FTA. See “Distance Measurement” for the detailed method.
3. FTA measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next THD measurement.

3.6.2.2.6 OOD measurement

Function: Calculate GA based on OOD..

Measurement method:

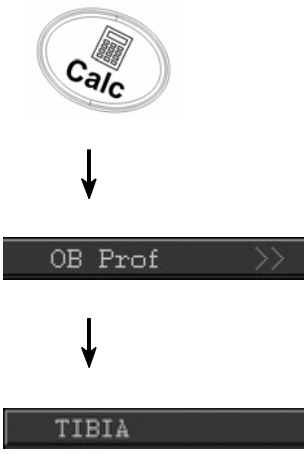


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “OOD”, press the【SET】key to go to “OOD” measurement mode.
2. Based on the pre-selected formula, if the corresponding measurement item is measured, then OOD is calculated automatically, and the result is displayed in the result window.

3.6.2.2.7 TIBIA measurement

Function: Calculate GA based on TIBIA.

Measurement method:

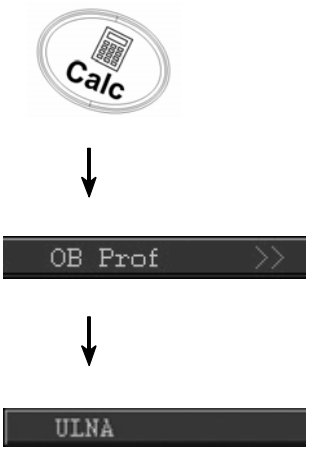


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “TIBIA.”, press the【SET】key to go to “TIBIA.” measurement mode.
2. Measure TIBIA. See “Distance Measurement” for the detailed method.
3. TIBIA measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next TIBIA measurement.

3.6.2.2.8 ULNA measurement

Function: Calculate GA based on ULNA.

Measurement method:



1. In B mode, scan and freeze the image, press the【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “OB Prof”, press the【SET】key to go to the submenu, move the trackball to select “ULNA.”, press the【SET】key to go to “ULNA” measurement mode.
2. Measure ULNA. See “Distance Measurement” for the detailed method.
3. ULNA measurement result is displayed in the result window, meanwhile based on the preset formula GA is displayed.
4. Repeat steps 1 to 3 to go to the next ULNA measurement.

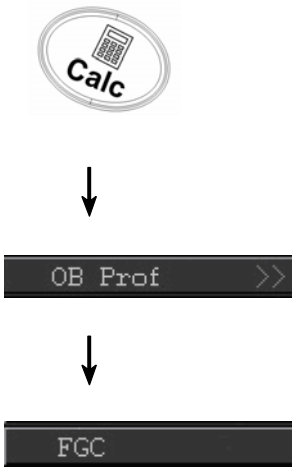
3.6.2.2.9 Input Last Menstrual Period (Input LMP)

Input the patient's LMP, so as to calculate GA and the fetal delivery date.

3.6.2.2.10 Fetal Growth Curve (FGC)

Function: FGC function is to compare the fetal measurement data with a normal FGC, so as to evaluate if the fetus grows properly. Generally it is determined by the inputted LMP, the measured data and the fetal growth indices.

Operation instruction:



1. Measure one or more fetal growth indices (GS, CRL, BPD, FL, AC, HC, AA, APAD, TAD, CER, FT, FTA, HA, HUM, OFD, THD).
2. Input LMP. In B mode, scan and freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select"OB Prof", press the【SET】key to go to the submenu, move the trackball to select "FGC", press the【SET】key to go to FGC mode.
3. The default display for FGC is "BPD" screen; on its right the formula displayed is the basic formula of the current growth curve. Move the cursor to other formula item, press the【SET】key to display the normal growth curve based on the algorithm of the formula, so as to evaluate the fetal growth.
4. The FGC displays the growth status of a certain index of the fetus, which is displayed in the image as a measurement value corresponding to the position on a growth curve (marked with "X" in the image).
5. The FGC can be displayed in one chart one screen, or four charts one screen. Press the matched button to setup. Press"Close" to exit FGC.

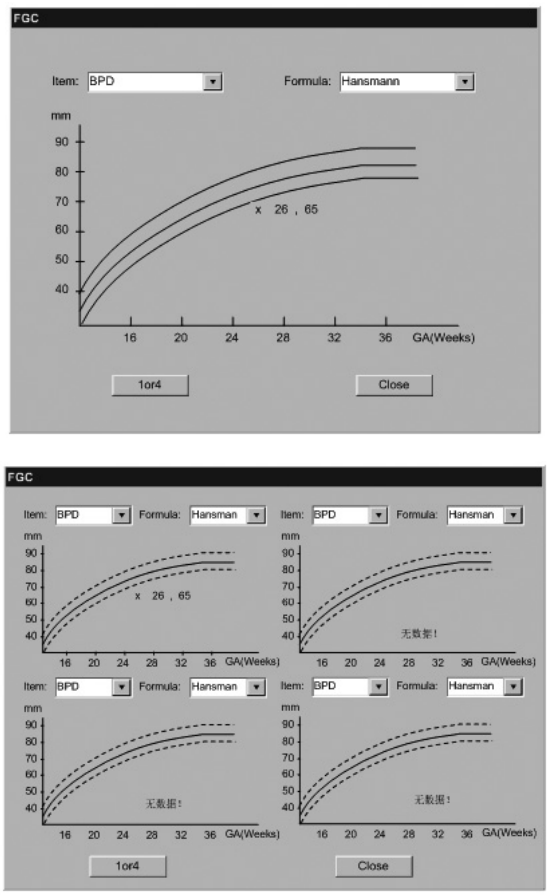


Fig. 3.6.2.2.9 Fetal Growth Curve (one graph/ four graphs)

3.6.2.2.11 Fetal Biophysical Profile (FBP)

When conducting FBP, acquire indices of fetal growth through testing or measurement, and use the grading method to evaluate if the fetus is at risk, which serves as a guiding index in clinical processing.

The FBP testing and measurement shall cover the following 6 indices:

Fetal Heart Rate (FHR)

Fetal Motion (FM)

Fetal Breathing Motion (FBM)

Fetal Tension of muscle (FT)

Amniotic Fluid (AF)

Placenta grading (PL)

Where in AF is acquired by measuring amniotic fluid depth; PL is based on placenta ultrasonic image, for which the placenta maturity is divided into 3 levels: Level 0,1,2.,3.

While the other indices are obtained through fetal reaction test, the fetal reaction test takes about 20-30 minutes.

Grading standard:

1) Fetal Heart Rate (FHR)

Observation duration: 20 minutes

Grading standard:

2: When fetal moves, FHR accelerates>=15 times/min, duration>=15S, >=5 times;

1: When fetal moves, FHR accelerates >=15 times/min, duration >=15S, 1 ~ 4 times;

0: When fetal moves, FHR accelerates <=1 time.

2) Fetal Motion (FM)

Observation duration: 30 minutes

Grading standard:

2: FM>=3 times

1: FM 1 ~ 2 times

0: No fetal movement

3) Fetal Breathing Motion (FBM)

Observation duration: 30 minutes

Grading standard:

2: FBM>=1 time, duration >=60S

1: FBM>=1 time, duration 30 ~ 60S

0: No FBM, or duration <=30S

4) Fetal Tension of muscle (FT)

Observation duration: 30 minutes

Grading standard:

2: >=1 time, extension and bending of extremities and the spine

1: >=1 time, extension and bending of extremities or the spine

0: extension of extremities, no bending, with hands open

5) Amniotic Fluid (AF)

Grading standard:

2: AF max. Depth>2cm

1: AF max. depth1 ~ 2cm

0: AF max. Depth<1 cm

6) Placenta grading (FL)

Grading standard:

2: PL<=2

1: back wall placenta, difficult to determine the PL

0: PL=3

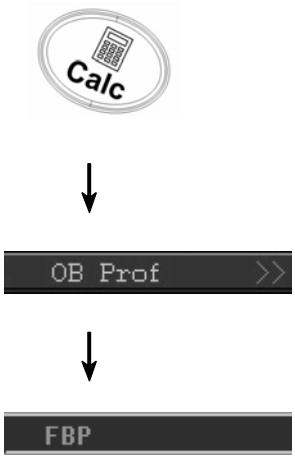
Based on single indices the fetal growth status is acquired as below:

2:	Normal
1:	Slightly abnormal
0:	Obviously abnormal

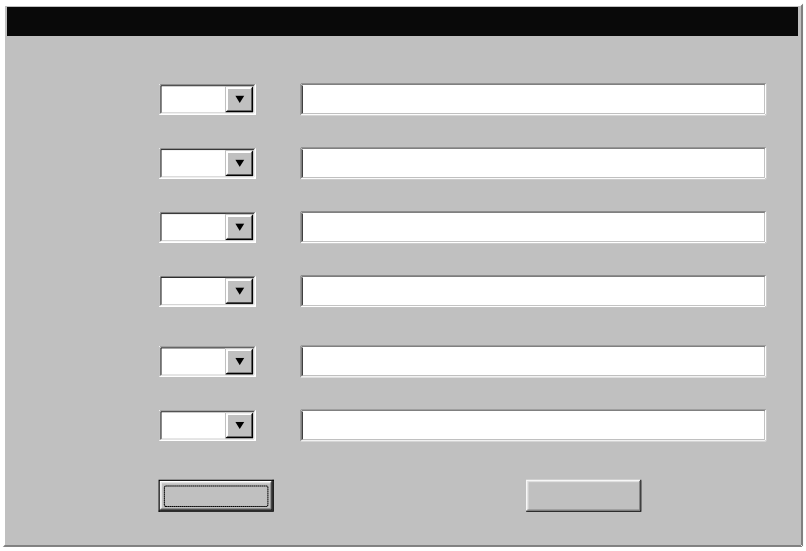
Total mark and general fetal growth status:

7 ~ 12	Normal fetus, with low risk of chronic suffocation
3 ~ 6	Suspicious of fetal chronic suffocation
0-2	Highly suspicious of fetal chronic suffocation.

Measurement method:



1. In B mode scan the image and freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN” soft key, press the 【SET】key to go to the submenu, move the trackball to select “FBP”, press the【SET】key to go to “FBP” mode.
2. go to the fetal grading FBP menu; there are six items: FHR, FM, FBM, FT, PL, AF , select any of them from the drop-down box, next to each item you can select 0, 1, 2; When it is finished, select Cancel to quit the selected grade and exit; select Report and go to FBP to report the screen. The reports displays grade for each item, total grade, a brief evaluation. Select Print to print it out ; select Exit to exit;



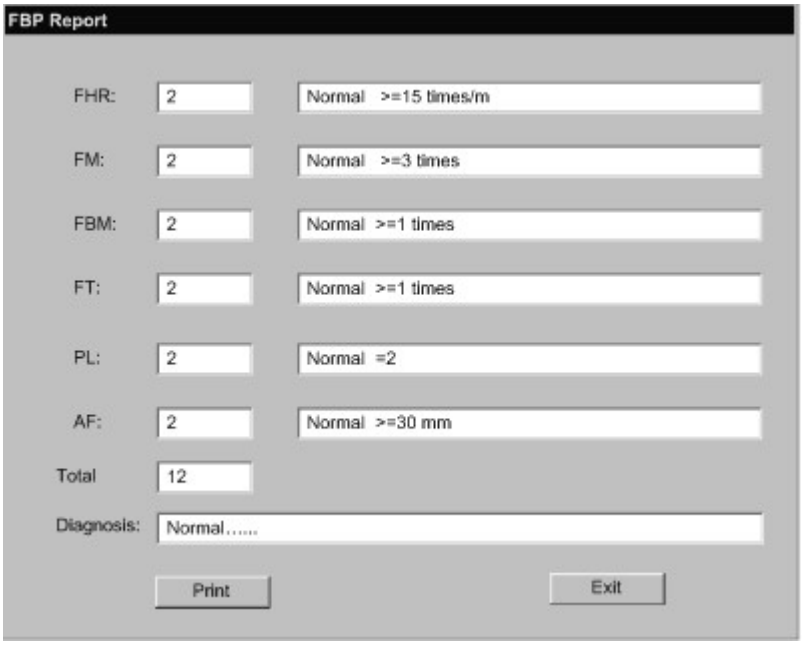


Fig. 3.6.2.2.10 FBP Grade Report

3.6.2.3 GYN measurement

GYN measurement includes:

Uterus measurement (UT)

Endometrium thickness measurement (ENDO)

Left ovary measurement (L.OV)

Right ovary measurement (R.OV)

Left follicle measurement (L.FO)

Right follicle measurement (R.FO)

Cervix long diameter measurement (CX)

Cervix length / Uterus length (CX-L /UT-L)

3.6.2.3.1 UT measurement

Function: Measure length, height and width of uterus in sequence

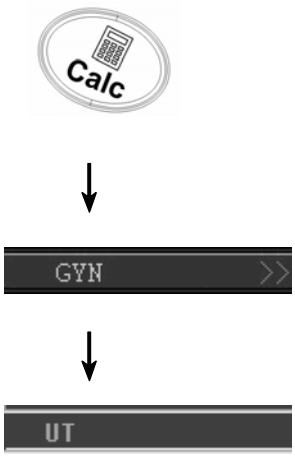
UT-L Uterus length (mm)

UT-H Uterus height (mm)

UT-W Uterus width (mm)

UT = UT-L + UT-H + UT-W

Measurement method:

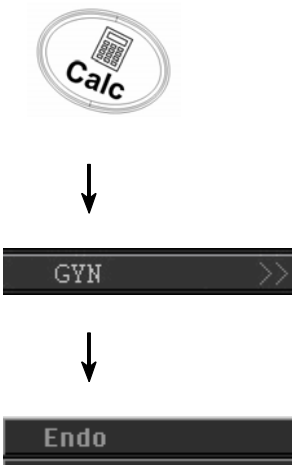


1. In B mode, scan and freeze the image, press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “UT”, press the【SET】key to go to “UT” measurement mode.
2. Measure UT-L, see “Distance Measurement” for the specific method.
3. Measure UT-H, see “Distance Measurement” for the specific method.
4. Measure UT-W, see “Distance Measurement” for the specific method
5. UT = UT-L + UT-H + UT-W, the measurement & calculation result is displayed in the result window.
6. Repeat steps 1 to 5 to go to the next UT measurement.

3.6.2.3.2 Endo (endometrium thickness) measurement

Function: Endo measurement is to measure endometrium thickness.

Measurement method:

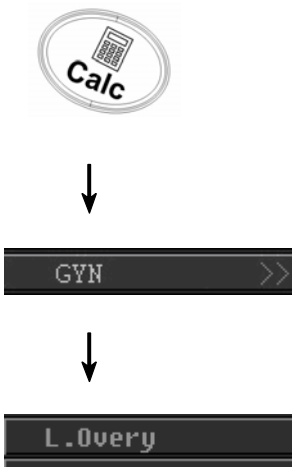


1. Press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “Endo”, press the【SET】key to go to “Endo” measurement mode.
2. Measure Endo; see “Distance Measurement” for the specific method.
3. The measurement result is displayed in the result window.
4. Repeat steps 1 to 3 to go to the next Endo measurement.

3.6.2.3.3 L.Ovary (Left Ovary) measurement

Function: Based on left ovary length, height and width: Lt L, Lt H, Lt W, to calculate left ovary volume: L.OV-V = 0.523 * Lt Lmm * Lt Hmm * LtWmm

Measurement method:

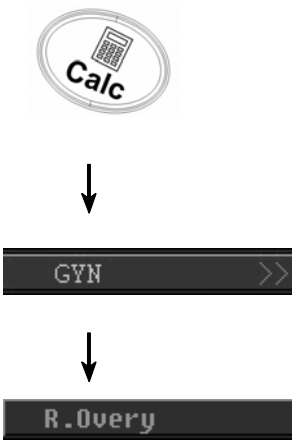


1. Press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “L.Ovary”, press the【SET】key to go to “L.Ovary” measurement mode.
2. Measure Lt L of left ovary, sees “Distance Measurement” for the specific method.
3. Measure Lt H of left ovary, sees “Distance Measurement” for the specific method.
4. Measure Lt W of left ovary, sees “Distance Measurement” for the specific method.
5. L.Ovary volume L.OV-V = 0.523 * Lt Lmm * Lt Hmm * Lt Wmm, and the measurement & calculation result is displayed in the result window.
6. Repeat steps 1 to 5 to go to the next L.Ovary volume measurement.

3.6.2.3.4 R.Ovary (Right Ovary) measurement

Function: Based on right ovary length, height and width: Rt L, Rt H, Rt W, to calculate right ovary volume: R.OV-V = 0.523 * Rt Lmm * Rt Hmm * Rt Wmm

Measurement method:

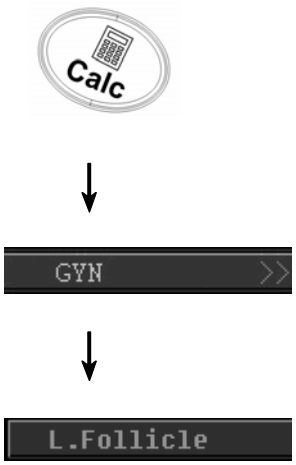


1. Press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “R.Ovary”, press the【SET】key to go to “R.Ovary” measurement mode.
2. Measure Rt L of right ovary; see “Distance Measurement” for the specific method.
3. Measure Rt H of right ovary; see “Distance Measurement” for the specific method.
4. Measure Rt W of right ovary; see “Distance Measurement” for the specific method.
5. R.Ovary volume R.OV-V = 0.523 * Rt Lmm * Rt Hmm * Rt Wmm, and the measurement & calculation result is displayed in the result window.
6. Repeat steps 1 to 5 to go to the next R.Ovary volume measurement.

3.6.2.3.5 L.Follicle (Left Follicle) measurement

Function: To measure length and width of left follicle: L.FO L, L.FO W

Measurement method:

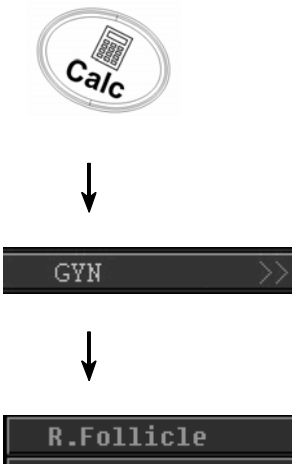


1. press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “L.Follice”, press the【SET】key to go to “L.Follice” measurement mode
2. Measure L.FO L of left follicle; see “Distance Measurement” for the specific method.
3. Measure L.FO W of left follicle; see “Distance Measurement” for the specific method.
4. The measurement result is displayed in the result area.
5. Repeat steps 1 to 4 to go to the next L.Follice measurement.

3.6.2.3.6 R. Follicle (Right Follicle) measurement

Function: To measure length and width of right follicle: R.FOL, R.FOW.

Measurement method:

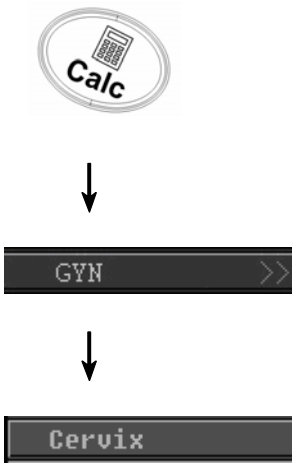


1. Press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select **"GYN",** press the【SET】key to go to the submenu, move the trackball to select **"**R. Follicle**"**, press the【SET】key to go to **"**R. Follicle**"** measurement mode.
2. Measure R.FO L of right follicle; see "Distance Measurement" for the specific method.
3. Measure R.FO L of right follicle; see "Distance Measurement" for the specific method.
4. The measurement result is displayed in the result area.
5. Repeat steps (1) to (4) to go to the next R. Follicle measurement.

3.6.2.3.7 CX (Cervix) measurement

Function: Measure cervix length CX-L, height CX-H and width CX-W in sequence.

Measurement method:

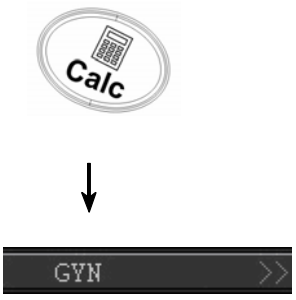


1. Press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “Cervix”, press the【SET】key to go to “Cervix” measurement mode.
2. Measure cervix length CX-L; see “Distance Measurement” for the specific method.
3. Measure cervix height CX-H; see “Distance Measurement” for the specific method.
4. Measure cervix width CX-W; see “Distance Measurement” for the specific method.
5. The measurement result is displayed in the result window.
6. Repeat steps 1 to 5 to go to the next Cervix measurement.

3.6.2.3.8 CX-L /UT-L

Function: To measure uterus length UT-L and cervix length CX-L, then to calculate their ratio UT-L/CX-L.

Measurement method:



1. In B mode freeze the image, press the 【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “GYN”, press the【SET】key to go to the submenu, move the trackball to select “CX-L /UT-L”, press the【SET】key to go to “CX-L /UT-L” measurement mode.
2. Based on ”Distance Measurement” method, measure cervix length CX-L
3. Based on ”Distance Measurement” method, measure cervix height CX-H
4. The measurement result is displayed in the result area. Repeat steps (1) to (2) to perform the next measurement.

3.6.2.4 Cardiac measurement

In B mode Cardiac measurement includes:

Left Ventricle (LV)

Right Ventricle (RV)

Pulmonary Artery(PA)

Left Ventricle Mass (LV Mass)

Left Ventricle Mass Weight Index (LVMWI)

3.6.2.4.1 LV function

The measurement items for LV function are:

Left Ventricular Area of Long axis diastolic	LVALd
Left Ventricular Length of long axis diastolic	LVLd
Left Ventricular Area of Long axis systolic	LVALs
Left Ventricular Length of long axis systolic	LVLs
Left Ventricular Area of short axis at Mitral valve diastolic	LVAMd
Left Ventricular Diameter of short axis diastolic	LVIDd
Left Ventricular Area of short axis at Mitral valve systolic	LVAMs
Left Ventricular Diameter of short axis systolic	LVIDs
Left Ventricular Area of short axis at Papilla diastolic	LVAPd
Left Ventricular Area of short axis at Papilla systolic	LVAPs

Calculation items and formulas involved are:

Calculation item	Formula	Unit
End-Diastolic Right Ventricular Volume (EDV)	EDV	ML
End-Systolic Right Ventricular Volume (ESV)	ESV	ML
Stroke Volume (SV)	SV=EDV-ESV	ML
Cardiac =Output(CO)	CO=SV×HR	L/Min
Ejection Fraction (EF)	EF=SV/EDV	No unit
Stroke Index (SI)	SI=SV/BSA	No unit
Cardiac Index (CI)	CI=CO/BSA	L/(Min·m2)
Fractional Shortening of RV short axis (FS)	FS=(LVIDd-LVIDs) /LVIDd	
Mean Ventricular Circumference Fractiional Shortening (MVCF)	MVCF= (LVIDd-LVIDs)/(LVIDd×ET)	

Where

BSA=WT0.425×HT0.725×73.58/1000 (Estern, WT KG, HT CM)

BSA=WT0.425×HT0.725×71.84/1000 (Western, WT KG, HT CM)

In B mode right ventricular measurement & calculation methods are:

Single-Plane (SPEllipse)

Bi-Plane (BPEllipse)

Bullet (Bullet)

Simpson (Simpson)

- **Single-Plane (SPEllipse)**

Measurement items: LVALd, LVLd, LVALs, LVLs

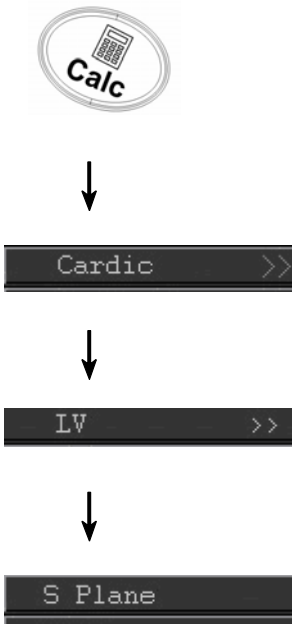
Calculation items: EDV, ESV, SV, CO, EF, SI, CI

Use the formula:

$$\textbf{EDV=}\ \frac{8}{3}\times\frac{LVALd^{2}}{\pi\times LVLd}$$

$$\textbf{ESV=}\ \frac{8}{3}\times\frac{LVALs^{2}}{\pi\times LVLs}$$

Measurement method:



1. In B mode freeze the image, press the 【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select **"Cardiac"**, press the【SET】key to go to the submenu, move the trackball to select **"LV"**, press the【SET】key to go to the submenu, move the trackball to select **"Single-Plane"**, press the【SET】key to go to measurement state.
2. Measure LVALd, see "Area/Cir measurement (Ellipse) "for the specific measurement method.
3. Measure LVLd, see "Distance Measurement" for the specific method.
4. Unfreeze the image, rescan the image, and freeze the image.
5. Measure LVALs, see "Area/Cir measurement (Ellipse) "for the specific measurement method.
6. Measure LVLs, see "Distance Measurement" for the specific method.
7. Based on the formula you can get EDV, ESV, SV, CO, EF, SI, and CI. The measurement and calculation result is displayed in the result window.
8. Repeat steps 1 to 7 to perform the next measurement.

- **Bi-Plane (BPEllipse)**

Measurement items: LVALd, LVAMd, LVIDd, LVALs, LVAMs, LVIDs;

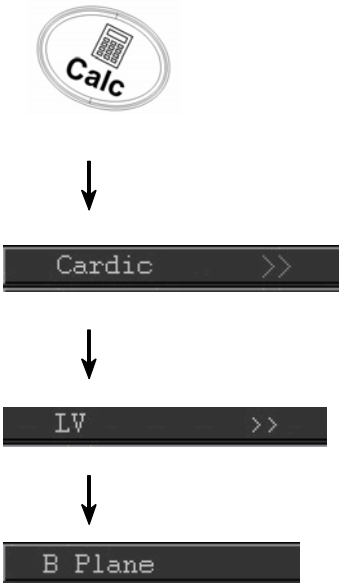
Calculation items: EDV, ESV, SV, CO, EF, SI, CI

Use the formula:

EDV= $\frac{8}{3} \times \frac{LVALd \times LVAMd}{\pi \times LVIDd}$

ESV= $\frac{8}{3} \times \frac{LVALs \times LVAMs}{\pi \times LVIDs}$

Measurement method:



1. In B mode freeze the image, press the 【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “LV”, press the 【SET】key to go to the submenu, move the trackball to select “Bi-Plane”, press the【SET】key to go to measurement state.
2. Measure LVALd, see “Area/Cir measurement (Trace)” for the specific measurement method.
3. Measure LVAMd, see “Area/Cir measurement (Ellipse)” for the specific measurement method.
4. Measure LVIDd, see “Distance Measurement” for the specific method.
5. Unfreeze the image, rescan the image, and freeze the image.
6. Measure LVALs, see “Area/Cir measurement (Trace)” for the specific measurement method.
7. Measure LVAMs, see “Area/Cir measurement (Trace)” for the specific measurement method.

8. Measure LVIDs, see “Distance Measurement” for the specific method.
9. Based on the formula you can get EDV, ESV, SV, CO, EF, SI, CI. The measurement and calculation result is displayed in the result window.
10. Repeat steps (1) to (9) to perform the next measurement.

- **Bullet (Bullet)**

Measurement items: LVAMd, LVLd, LVAMs, LVLs;

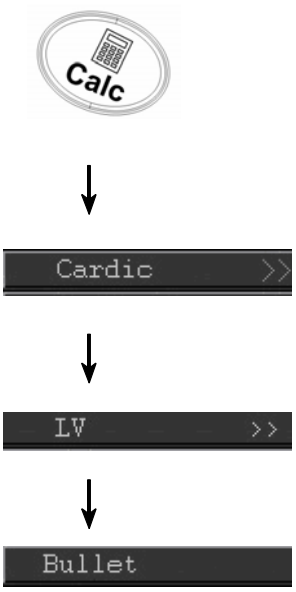
Calculation items: EDV, ESV, SV, CO, EF, SI, CI

Use the formula:

$$\text{EDV=} \frac{5}{6} \times LVLd \times LVAMd$$

$$\text{ESV=} \frac{5}{6} \times LVLs \times LVAMs$$

Measurement method:



1. In B mode freeze the image, press the 【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “LV” , press the【SET】key to go to the submenu, move the trackball to select “Bullet”, press the 【SET】key to go to measurement state.
2. Measure LVAMd, see “Area/Cir measurement (Ellipse)” for the specific measurement method.
3. Measure LVLd, see “Distance Measurement” for the specific method.
4. Unfreeze the image, rescan the image, and freeze the image.
5. Measure LVAMs, see “Area/Cir measurement (Trace)” for the specific measurement method.
6. Measure LVLs, see “Distance Measurement” for the specific method.
7. Based on the formula you can get EDV, ESV, SV, CO, EF, SI, CI. The measurement and calculation result is displayed in the result window.
8. Repeat steps (1) to (7) to perform the next measurement.

- **Simpson (Simpson)**

  Measurement items: LVAMd, LVLd, LVAPD, LVAMs, LVLs, LVAPs;

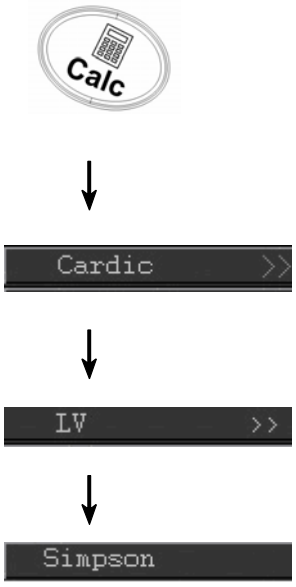
  Calculation items: EDV, ESV, SV, CO, EF, SI, CI

  Use the formula:

  EDV= $\frac{LVLd}{9}\times\left(4\times LVAMd+2\times LVAPd+\sqrt{LVAMd\times LVAPd}\right)$

  ESV= $\frac{LVLs}{9}\times\left(4\times LVAMs+2\times LVAPs+\sqrt{LVAMs\times LVAPs}\right)$

Measurement method:



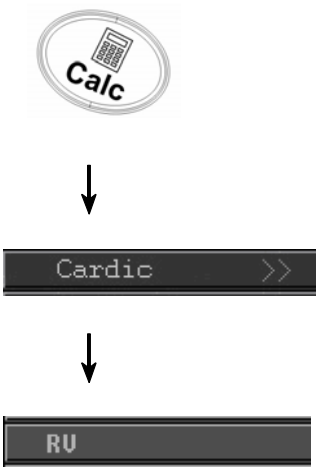
1. In B mode freeze the image, press the 【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “LV” , press the 【SET】key to go to the submenu, move the trackball to select “Simpson”, press the【SET】 key to go to measurement state.
2. Measure LVAMd, see “Area/Cir measurement (Ellipse)” for the specific measurement method.
3. Measure LVLd, see “Distance Measurement” for the specific method.
4. Measure LVAPD; see “Area/Cir measurement (Ellipse)” for the specific measurement method.
5. Unfreeze the image, rescan the image, and freeze the image.
6. Measure LVAMs, see “Area/Cir measurement (Ellipse)” for the specific measurement method.
7. Measure LVLs, see “Distance Measurement” for the specific method.

8. Measure LVAPs, see “Area/Cir measurement (Ellipse)” for the specific measurement method.
9. Based on the formula you can get EDV, ESV, SV, CO, EF, SI, and CI. The measurement and calculation result is displayed in the result window.
10. Repeat steps (1) to (9) to perform the next measurement.

3.6.2.4.2 Right Ventricle inner diameter (RV)

Function: To measure Right Ventricle inner diameter.

Measurement method:

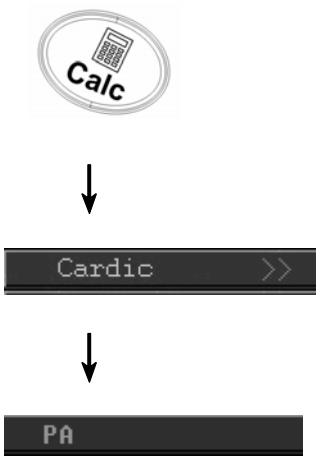


1. In B mode freeze the image, press the 【Calc】 key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “RV”, press the 【SET】 key to go to measurement state.
2. Measure RV; see “Distance Measurement” for the specific method.
3. The measurement result is displayed in the result window. Repeat steps 1 to 2 to perform the next measurement.

3.6.2.4.3 Pulmonary Artery inner diameter (PA)

Function: To measure Pulmonary Artery inner diameter.

Measurement method:



1. In B mode freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “PA”, press the 【SET】 key to go to measurement state.
2. Measure PA; see “Distance Measurement” for the specific method.
3. The measurement result is displayed in the result window. Repeat steps 1 to 2 to perform the next measurement.

3.6.2.4.4 Left Ventricular Mass (LV Mass)

Function: Based on this measurement item, to calculate Left Ventricular Mass.

The items to be measured are:

LVPWd	Left Ventricular Posterior Wall thickness diastolic	cm
IVSTd	Left Ventricular Septal thickness diastolic	cm
LVIDd	Left Ventricular Short Axis Diameter diastolic	cm

Calculation formula:

LV Mass (g) = 1.04*(LVPWd+IVSTd+LVIDd) 3 -LVIDd 3 –13.6

Measurement method:

1. In B mode freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “LVM”, press the【SET】key to go to measurement state.
2. Measure LVPWd, see “Distance Measurement” for the specific method.
3. Measure IVSTd, see “Distance Measurement” for the specific method.
4. Measure LVIDd, see “Distance Measurement” for the specific method.
5. Based on the formula to calculate LV Mass, the measurement and calculation result is displayed in the result window.
6. Repeat steps 1 to 5 to go to the next LV Mass measurement.

3.6.2.4.5 Left Ventricle Mass Weight Index (LVMWI)

Function: Based on patient’s height, weight and LV Mass, to calculate LVMWI.

The formula:

$$\text{LVMWI=LV Mass (g)/BSA (m}^2\text{)}$$

Measurement method:

1. In B mode freeze the image, press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Cardiac”, press the【SET】key to go to the submenu, move the trackball to select “LVMI”, press the【SET】key to go to.
2. Based on patient’s height and weight, calculate patient’s surface area. Based on the measured patient’s LV mass, calculate LVMWI. The calculation result is displayed in the result window. If height & weight are not inputted or no LV Mass measurement is performed, this item is not calculated.
3. Repeat steps 1 to 2 to go to the next calculation.

3.6.2.5 Small Part measurement

Small Part measurement includes:

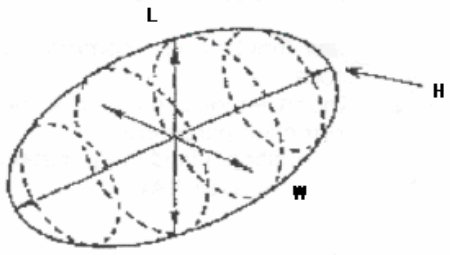
Urology measurement

Prostate measurement

Thyroid measurement

3.6.2.5.1 URO measurement (RUV)

Function: Based on the measurement of three diameters on two orthogonal planes, the bladder volume is estimated (Bi-Plane).



Measurement formula:

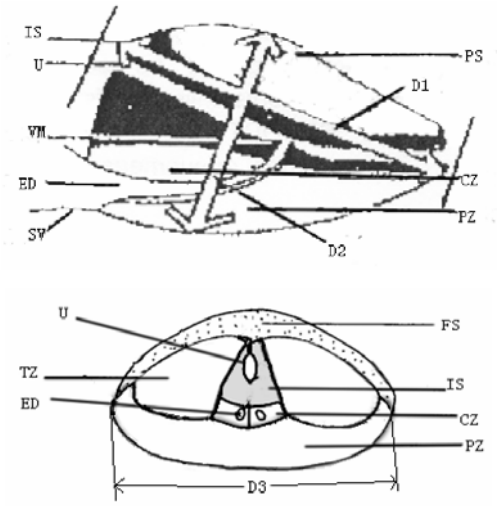
volume = 0.7 × Length × Width × Height.

Measurement method:

1. Press the 【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Small Part”, press the【SET】key to go to the submenu, move the trackball to select “URO”, go to “URO” measurement mode.
2. Measure bladder long diameter Length; see “Distance Measurement” for the specific method.
3. Measure bladder width Width, see “Distance Measurement” for the specific method.
4. Measure bladder height Height, see “Distance Measurement” for the specific method.
5. Based on the formula to perform calculation, the measurement result is displayed in the result area.
6. Repeat steps (1) to (5) to perform the next measurement.

3.6.2.5.2 Prostate measurement (PSV)

Function: By measuring length, width and height of prostate, the whole prostate volume is estimated (Bi-Plane)



Description: D1 is prostate antero-posterior diameter

D2 is prostate head-tail diameter

D3 is prostate transversal diameter

PV **PV = (π/6) ×D1 × D2 × D3**

Prostate antigen density **PSAD = PSA/PV**

Where PSA (unit: ng) is the blood serum value, which can be inputted by the user, or calculated from PSA = 0.12×PV.

Measurement method:

1. press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Small Part”, press the【SET】key to go to the submenu, move the trackball to select “prostate “, go to “prostate “measurement mode.
2. Measure prostate long diameter D1; see “Distance Measurement” for the specific method.
3. Measure prostate width D2, see “Distance Measurement” for the specific method.
4. Measure prostate height D3, see “Distance Measurement” for the specific method.
5. Based on the formula to perform calculation, the measurement and calculation result is displayed in the result area.
6. Repeat steps 1 to 5 to perform the next measurement.

3.6.2.5.3 Thyroid measurement (THY)

Function: By measuring thyroid length, width and height, thyroid volume is estimated.

Calculation formula:

thyroid volume = 0.520 × Length× Height× Width.

Measurement method:

1. press the【Calc】key to pop up the Meas & Calc menu, move the trackball, use the cursor to select “Small Part”, press the【SET】key to go to the submenu, move the trackball to select “thyroid “, go to “thyroid “measurement mode.
2. Measure thyroid long diameter Length; see “Distance Measurement” for the specific method.
3. Measure thyroid width Width, see “Distance Measurement” for the specific method.
4. Measure thyroid height Height, see “Distance Measurement” for the specific method.
5. Based on the formula to calculate thyroid volume, the measurement and calculation result is displayed in the result area.
6. Repeat steps 1 to 5 to perform the next measurement.

3.6.3 M mode measurement

In M mode the measurement menus are:

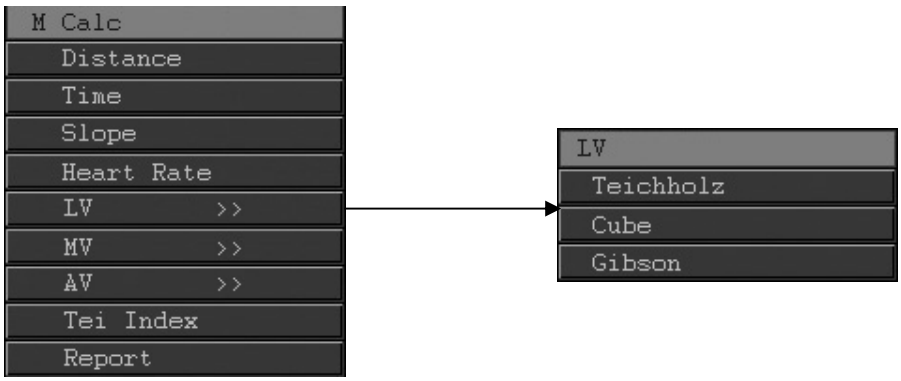


Fig. 3.6.3 M mode measurement menu

3.6.3.1 Distance Measurement

Function: To measure the distance of two points on the M image.

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “Distance “ , press the【SET】key to confirm going to Distance Measurement mode.
2. Move cursor to the measurement start point , press the 【SET】key, on the measurement start point it displays the fix mark “ +”.
3. Use the trackball to move the cursor. Now the cursor can only be shifted in the vertical direction. In the result window it displays the measurement value.
4. Use the trackball to shift the cursor to the measurement end point, press the【SET】key, on the measurement end point it displays the fix mark “+”, the measurement result is fixed, and it ends the measurement.
5. Repeat steps 1 to 4 to perform the next measurement.

3.6.3.2 Time measurement

Function: To measure the time interval of two points on the M image

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “Time”, press the 【SET】key to confirm going to Time measurement mode.
2. Move the cursor to the measurement start point, press the 【SET】key, on the measurement start point it displays the fix mark “+”.
3. Use the trackball to move the cursor. Now the cursor can only be shifted in the horizontal direction. In the result window it displays the measurement value.
4. Use the trackball to shift the cursor to the measurement end point. Press the 【SET】key, on the measurement end point it displays the fix mark “+”, the measurement result is fixed, and it ends the measurement.
5. Repeat steps 1 to 4 to perform the next measurement.

3.6.3.3 Slope measurement

Function: To measure slope (velocity) between two points, as well as distance and time.

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “Slope “, press the【SET】key to confirm going to Slope measurement mode.
2. Move the cursor to the measurement start point , press the 【SET】key, on the measurement start point it displays the fix mark “ x”.
3. Use the trackball to move the cursor, now the “ +”cursor and the ”x” cursor for the measurement start point are connected by a dotted line. In the result window it displays the measurement value.

4. Use the trackball to shift the " +" cursor to the measurement end point, press the【SET】key, on the measurement end point it displays the fix mark " x", the measurement result is fixed, and it ends the measurement.

5. Repeat steps 1 to 4 to perform the next measurement.

3.6.3.4 HR measurement

Function: To calculate heart rate per minute on the heart beat image.

Measurement method:

1. Measurement method: In M or B/M mode frozen state, press the 【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select "HR", press the 【SET】key to confirm going to HR measurement mode.

2. Move the trackball , place the " +"cursor on the heart beat point to be measured, press the 【SET】key to fix the measurement start point , the cursor becomes a "x".

3. Move the trackball , now "x" and "+" are connected by a dotted line. In the result window it displays the measurement value.

4. Place the "+"cursor on the next heart beat point, press the 【SET】key to fix the measurement end point. This measurement ends, and the measurement result is displayed in the result window.

5. Repeat steps 1 to 4 to perform the next measurement.

3.6.3.5 LV function measurement (LV)

For the measurement and calculation items of LV function, see "3.6.2.4.1LV function".

For M mode, there are three methods to evaluate LV function: CUBE, TEICHHOLZ, and GIBSON.

3.6.2.5.1 TEICHHOLZ

Function: To calculate LV volume by calculating the cube of a given region.

Measurement items: LVIDd, LVIDs;

Calculation items: EDV, ESV, SV, CO, EF, SI, CI, MVCF, FS

Use the formula:

$$\textbf{EDV} = \frac{7 \times LVId^3}{2.4 + LVIDd}$$

$$\textbf{ESV} = \frac{7 \times LVIs^3}{2.4 + LVIDs}$$

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select "LV function", press the 【SET】key to go to the subdirectory, move the trackball, use the cursor to select "TEICHHOLZ", press the 【SET】key to confirm going to TEICHHOLZ measurement mode.
2. Measure LVIDd, see "3.6.3.1 Distance Measurement" for the specific measurement.
3. Measure LVIDs, see "3.6.3.1Distance Measurement" for the specific measurement.
4. The measurement and calculation result is displayed in the result window.
5. Repeat steps 1 to 4 to perform the next measurement.

3.6.2.5.2 CUBE

Function: Calculate LV volume by calculating the cube of given region.

Measurement items: LVIDd, LVIDs;

Calculation items: EDV, ESV, SV, CO, EF, SI, CI, MVCF, FS

Use the formula:

$$EDV = LVIDd^3$$

$$ESV=LVIDs^3$$

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “LV function”, press the 【SET】key to go to the subdirectory, move the trackball, use the cursor to select “CUBE”, press the 【SET】key to confirm going to CUBE measurement mode.
2. Measure LVIDd, see “3.6.3.1 Distance Measurement” for the specific measurement.
3. Measure LVIDs, see “3.6.3.1Distance Measurement” for the specific measurement.
4. The measurement and calculation result is displayed in the result window.
5. Repeat steps 1 to 4 to perform the next measurement.

3.6.2.5.3 GIBSON

To calculate LV volume by calculating the cube of a given region.

Measurement items: LVIDd, LVIDs;

Calculation items: EDV, ESV, SV, CO, EF, SI, CI, MVCF, FS

Use the formula:

$$\mathbf{EDV}=\frac{\pi}{6}\times(0.98\times LVIDd+5.90)\times LVIDd^2$$

$$\mathbf{ESV}=\frac{\pi}{6}\times(0.98\times LVIDs+5.90)\times LVIDs^2$$

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “LV function”, press the 【SET】key to go to the subdirectory, move the trackball, use the cursor to select “GIBSON”, press the 【SET】key to confirm going to GIBSON measurement mode.
2. Measure LVIDd, see “3.6.3.1 Distance Measurement” for the specific measurement.
3. Measure LVIDs, see “3.6.3.1 Distance Measurement” for the specific measurement.
4. The measurement and calculation result is displayed in the result window.
5. Repeat steps 1 to 4 to perform the next measurement.

3.6.3.6 Mitral Valve measurement (MV)

Function: In M or B/M mode frozen state, based on image from values for points A to F, to navigate from points A~F, measure point by point, display Amplitude of E wave (CE), Amplitude of DE wave (DE), Amplitude of A wave (CA), Mitral value opening speed (DE), Mirral value closing speed (EF), Ratio between amplitude A and amplitude E (A/E).

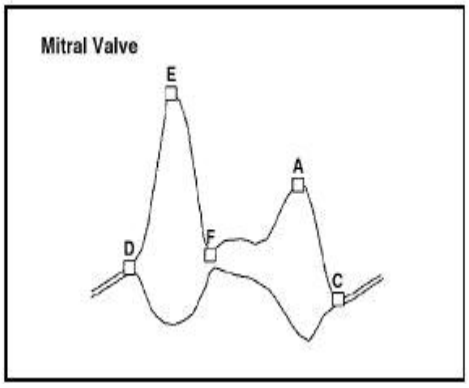


Fig. 3.6.3.6 MV measurement roadmap

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “MV measurement “ , press the 【SET】key to confirm going to MV measurement mode.
2. Measure CE, see “3.6.3.1 Distance Measurement” for the specific measurement.
3. Measure DE, see “3.6.3.1 Distance Measurement” for the specific measurement.
4. Measure CA, see “3.6.3.1 Distance Measurement” for the specific measurement.
5. Measure DE, see “3.6.3.1 Distance Measurement” for the specific measurement.
6. Measure EF, see “3.6.3.1 Distance Measurement” for the specific measurement.
7. Calculate A/E, and the measurement and calculation result is displayed in the result window.
8. Repeat steps 1 to 7 to perform the next measurement.

3.6.3.7 Aortic valve measurement (AO)

Function: In M or B/M mode frozen state, measure each index for aortic valuve:

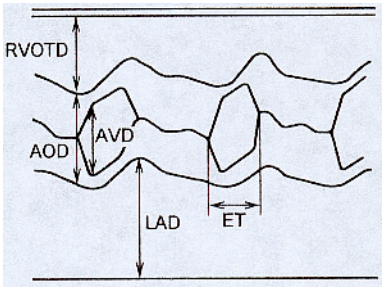


Fig. 3.6.3.7 AO measurement roadmap

Measurement items:

Measurement item	Description	Measurement instruction
AOD	Aorta diameter	Direct distance measurement
LAD	Left atrium diameter	Direct distance measurement
AVD	Aortic valve opening diameter	Direct distance measurement
ET	Ejection time	Direct distance measurement
RVOTD	Left ventricular outflow track diameter	Direct distance measurement
AA	Aorta amplitude	Direct distance measurement

Calculation items:

Calculation	Description	Calculation formula
LA/AO	Left Atrium/Aorta ratio	LAD/AOD
AVSV	Aortic Valve Stroke Volume	(MAVO1+MAVO2) xLVET 50+AA

MAVO1 is the distance where aorta starts opening;

MAVO2 is the distance where aorta stops opening;

AA is the aorta posterior wall motion amplitude.

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “AV measurement “ , press the 【SET】key to confirm going to AV measurement mode.
2. Measure AOD, see “3.6.3.1 Distance Measurement” for the specific measurement.
3. Measure LAD, see “3.6.3.1 Distance Measurement” for the specific measurement.
4. Measure AVD, see “3.6.3.1 Distance Measurement” for the specific measurement.
5. Measure ET, see “3.6.3.1 Distance Measurement” for the specific measurement.
6. Measure RVOTD, see “3.6.3.1 Distance Measurement” for the specific measurement.
7. Calculate AA, and the measurement and calculation result is displayed in the result window.
8. Repeat steps 1 to 7 to perform the next measurement.

3.6.3.8 Ejection Time (ET)

Function: To measure the time between two ejections.

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “ET”, press the 【SET】key to confirm going to ET mode.
2. Measure ejection time ET, see “3.6.3.2 Time Measurement” for the specific measurement.
3. The measurement result is displayed in the result window.
4. Repeat steps 1 to 3 to perform the next measurement.

3.6.3.9 TEI measurement

Function: To calculate based on ICT (Isovolumic Contraction Time) and IRT (Isovolumic Relaxation Time).

Formula:

$$TEI = (ICT + IRT) / ET$$

Measurement method:

1. In M or B/M mode frozen state, press the【Calc】key to pop up the Meas & Calc menu in M mode, move the trackball, use the cursor to select “TEI measurement “ , press the【SET】key to confirm going to TEI measurement mode.
2. Measure ICT, see “3.6.3.2 Time Measurement” for the specific measurement.
3. Measure IRT, see “3.6.3.2 Time Measurement” for the specific measurement.
4. Calculate TEI, and the measurement & calculation result is displayed in the result window.
5. Repeat steps 1 to 4, to perform the next measurement.

3.7 Other Operation

3.7.1 Save

3.7.2 Saving exam mode

To meet requirements of high-level users, the User Define mode can be set up in the system.

In real-time mode, press the【Save】 key to active User Define page. Click [Exit] to exit User Define mode page.

User Define mode page is shown below:

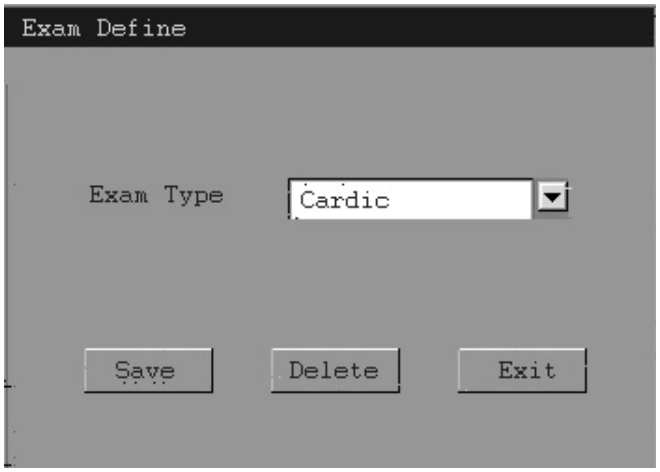


Fig. 3.7.1.1 User-define page

Here is the instruction on how to operate User Define screen:

- **Save** click it in the pop-up input dialog, input the name of a new exam mode. Click OK to save the new exam mode and exit User Define page; The new defined exam mode will be added to the exam mode select screen, then the user may select in the exam mode select page.
- **Del** In the com–box, selects the exam mode to be deleted. Click Del to delete the selected exam mode.

  Note: Only the User Define mode can be deleted.

3.7.2.1 Saving image file

In frozen mode, press the【Save】 key to go to image file saving page. Click [Exit], or press number key '3' to exit image file saving page.

The image file saving page is shown below:

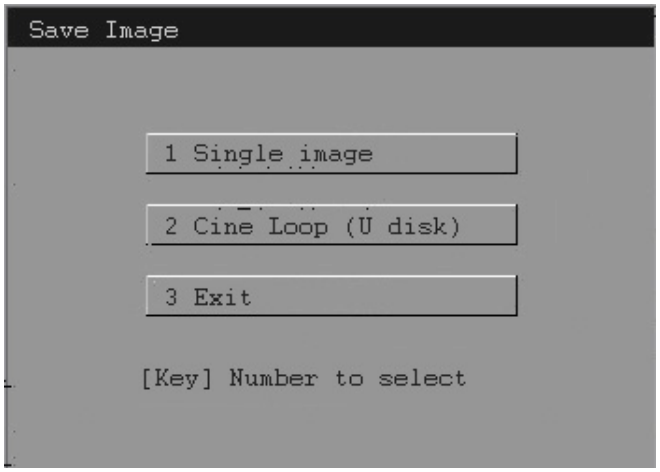


Fig. 3.7.1.2 Save image file page

Here is the instruction on how to operate image file saving:

- **Single Image** Click, or press number key '1' to save the current frozen single image (jpg or bmp format); in the pop-up input dialog, input the name of the new image. Click OK to save the new image and exit image file saving page; The new image is default to be saved in the system disk. After the new image is saved, the user can manage in the Disk Management.

- **Cineloop** Click or press number key '2' to save the current cine file. In the pop-up input dialog, input the name of the new cine. Click OK to save the new cine and exit image file storage screen. After saving the cine, the user can manage in the Disk Management screen. The saved cine file is a fixed 256 frames before freezing the image (dependent on modes) ;

NOTE:

The cine can be saved only when a USB disk is plugged in and sufficient capacity is available, otherwise it will prompt that no info can be saved.

3.7.3 Cineloop

The system has cineloop function. Based on modes and configuration, the saving depth is somewhat different.

3.7.3.1 Single image cineloop

After freezing the image, a frozen indicator is displayed at bottom right of the screen, and there is a replay bar display;

By scrolling the trackball slowly, the user can review the just acquired imaged, and the current frame number is also displayed in the replay indication bar.

NOTE:

After releasing the frozen state, the system will refresh the replay images.

3.7.3.2 Continuous cineloop

In the frozen state, by scrolling the trackball horizontally, the user may go to continuous cineloop, and the current frame number is displayed in the replay indication bar. Touch the trackball slightly, and the cineloop is stopped, and it goes to single frame cineloop mode.

3.7.3.3 M mode cineloop

The M mode cineloop is basically the same as B mode cineloop; however, after pressing the 【Freeze】button in M mode, the image is not frozen immediately, but be frozen only when the current image scanning is finished.

For B/M mode cineloop, there are two modes in the system: Scroll and Dual Dynamic Cineloop. Scroll is a conventional M mode cineloop mode, during cineloop the B mode image is static, while the M mode image is played back from beginning to end; in Dual Dynamic Cineloop, both the B mode image and the M mode image are updated in real-time, which is good for the user to know the B mode feature while observing M mode data.

3.7.3.4 Review images

See **Section 3.7.1.2**;

3.7.4 Clipboard

In the clipboard, the thumbnails of the latest saved 5 ultrasound images can be displayed in sequence. By pressing the scroll button, up to 100 user saved images can be reviewed.

The clipboard interface is shown below:

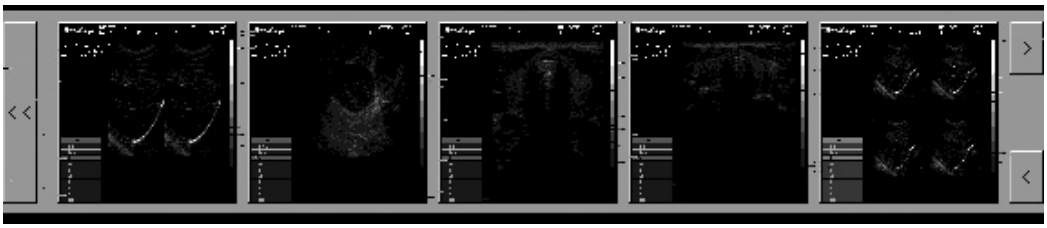


Fig. 3.7.3 Clipboard screen

In frozen mode, press the【Clipbaord】key, go to Clipboard page.

Press the【Clipbaord】key again or click”<<“at the bottom left of the image area to exit the clipboard screen.

Here is the instruction on how to operate the clipboard:

- **>** Shift to the next thumbnail. Every click will shift the thumbnail leftward in sequence. The fifth thumbnail displays the latest ultrasound image. If it is shifted to the last image, the next click is invalid.
- **<** Shift to the previous thumbnail. Every click will shift the thumbnail rightward in sequence. The first thumbnail displays the latest ultrasound image. If it is shifted to the last image, the next click is invalid.
- **<<** Exit the clipboard.
- **Recall image** Move the trackball to the target thumbnail, press the【SET】key, and that ultrasound image call be recalled.
- **Exit** In the recall state, pressing Exit at the bottom right will return to the clipboard inerface.

3.7.5 Software Upgrade

The system has Linux system platform, and the system software and the application software can be upgraded through the USB port, so as to ensure system update to new technologies.

Please make sure the followings when upgrading the system:

1. Ensure that the power supply to the system is normal during system upgrade;
2. DO NOT unplug the USB disk or avoid human interruption during system upgrade;
3. The USB disk for upgrade shall be USB2.0 compatible, and the upgrade files can only be placed in the root directory of the USB disk. It is forbidden to place files for non-upgrade purpose in the USB disk;

4. The format for the files in the USB disk is fixed, and two fixed files: license.dat, upgradeXXX.dat is included. In the disk, “license.dat” is the license file for system upgrade, which includes information of the serial number for the system to be upgraded and the software release for upgrade. This file is specific to different machines. “upgradeXXX.dat” is the upgrade package, XXX refers to the software release; only when “license.dat” is the right one for the upgrade target machine, and can the system be upgraded.

Here are the specific upgrade steps:

1. Power up the system, and go to the normal imaging screen;
2. Plug in the special USB disk for upgrade purpose. At the bottom right of the screen it displays a USB disk icon;
3. Key in shift, menu, e, and an upgrade prompt box is displayed;
4. Input the upgrade license of the target machine, and click OK;
5. The system will be upgraded automatically. When the upgrade is finished, the system will be rebooted;

NOTE:

The current software release is saved in System Setting menu, in the form like Ver 1.01.

4 Transducer

4.1 Use transducer

The system can support a variety of transducders for applications on body regions such as abdominal, superficial, OB/GYN, endocavity, cardiac, urologic and musculo-skeletal. All the transducers are broadband, with multiple frequencies ranging from 2.0MHz to 12.0MHz. According to advanced processing technique and precise matching with the system, the transducers are featured with high density and high sensitivity. See Section 5.2 for detailed information on how to use the transducers.

4.2 Use biopsy guide

A biopsy switch is available for image control. Turn the switch on, and a group of biopsy lines are activated on the screen; meanwhile, the menu will have two additional controls for biopsy line angle and position. The suer may confirm orientation of the biopsy line by controlling the angle and the position of the biopsy line.

For detailed information on the installation of biopsy guide, refer to the instruction for the biopsy guide.

4.3 Transducer Specifications

Item	Transducer Model	Application	Freq （MHz）	Angle/ Width
1	**C351**/3.5MHz/R50mm,Convex	Abdominal /GYN/OB	5-2	86°
2	**C352**/3.5MHz/R50mm,Convex	Abdominal /GYN/OB	5-2	86°
3	**C543**/5.0MHz/R40mm,Convex	Abdominal	7-4	82.5°
4	**L745**/7.5MHz/50mm,Linear	Small Parts	10-5	46mm
5	**L746**/7.5MHz/50mm,Linear	Small Parts	10-5	46mm
6	**L773**/7.5MHz/66mm,Linear	Small Parts	10-5	66mm
7	**10L2**/10.0MHz /49mm,Linear	Small Parts	12-7	36mm
8	**C312**/3.5MHz/R15mm, micro-convex	Cardiac	5-2	95°
9	**C612**/6.5MHz/R13mm, micro-convex	Veterinary	8-5	90°
10	**6V4**/6.5MHz/R13mm, Micro-convex	Transvaginal	9-5	186°
11	**6V5**/6.5MHz/R13mm, Micro-convex	Transvaginal	9-5	186°
12	**EC2**/6.5MHz/R10mm, Micro-convex	Endocavity	9-5	148°
13	**L663V**/9-5MHz/60mm, Linear,	Veterinary	9-5	61mm

5 System Maintenance

5.1 Main Unit

5.1.1 Maintenance

The system is a precise electrical device. To ensure the best performance and operation of the system, observe proper maintenance procedures. You warrant safety and effectiveness of the system, it is recommended to conduct a preventative maintenance for the system once every year, and it shall be performed by a professional from the manufacturer or an authorized person.

The daily maintenance shall mainly cover:

- Use a piece of dry cloth to clean the system plastic housing and the keyboard;
- Use special soft cloth and cleanser to clean the LCD;
- Clean and remove the dust from the dust net at the bottom of the system, so as to ensure that the system is clean inside and the ventilation is good;
- Check if the grounding of the system is good, whether it complies with relevant safety requirements;
- Check the operating environment of the system, so as to ensure that the operation environment is good, which assures long-term stable running of the system.

5.1.2 Installation

The system is a portable diagnostic device.

Before installation, please pay attention to the following:

- The environment where the system is in use shall comply with the requirements in its technical specifications;
- Take out the system from the package; ensure that the system cosmetic is good, without any obvious damage;
- The system shall be placed on a even platform, without any irrelevant items around;
- The grounding post at the back of the system shall be connected to a terminal complying with grounding standard.

5.1.3 System Transport

When moving or transporting the system, take the precautions outlined below to ensure maximum safety for personnel, the system, and other equipment. After the system is positioned to a new place, ensure that the system is placed on a secure level.

Before moving or transporting the system, observe the following:

1. Completely power down the system; plug out the power cord.
2. Disconnect all the transducers, and store all transducers in their original cases;
3. Disconnect all peripheral devices;
4. Lift the system when all the above items are observed.
5. For long-distance transport, observe the additional precautions below:
6. Pack the system properly. It is recommended to pack it with its original package, so as to avoid impact, shock or pressure during transport;
7. Do not place the system upside down during transport;
8. For environmental requirements on transport, see relevant sections in this manual.

5.2 Transducer

Before using the transducer, check if there is any damage in the transducer housing, cable or connector. If there is, contact the service agent. Using ultrasound gel on the transducer surface as coupling between the patient and the transducer. After finishing the exam, conduct necessary cleaning and disinfection.

WARMING:

Only the manufactured transducer can be used with the system. Connecting the transducer to any other system may result in electric shock or damage.

5.2.1 Maintenance

The structure of the convex and the linear transducers is shown in Fig 5-1a.

- The probe may be damaged even by a slight impact. Use it carefully to avoid shocking or striking against any hard object;
- Ensure that the main unit is in frozen or power-down state while connecting or disconnecting a probe;
- Be very careful not to scratch the probe head surface (acoustic lens);
- Use a sponge or soft cloth soaked with water to clean the probe after use. DO NOT use alcohol or wiper containing alcohol or other organic solvent like diluent to do the cleaning.
- The probe shall not be inserted into water over the bonding boundary,or it may lead to potential damage. In this case, please contact our service immediately;
- If the probe cable is exposed due to scratch, please stop to use it and contact our service immediately.
- Install the transducer by rotating the locker in the indicated direction, and avoid to damage the connector;

- Avoid twisting the transducer cable when using the transducer.
- Use qualified acoustic coupling gel only. Avoid damage to the transducer acoustic lens due to gel with bad quality.

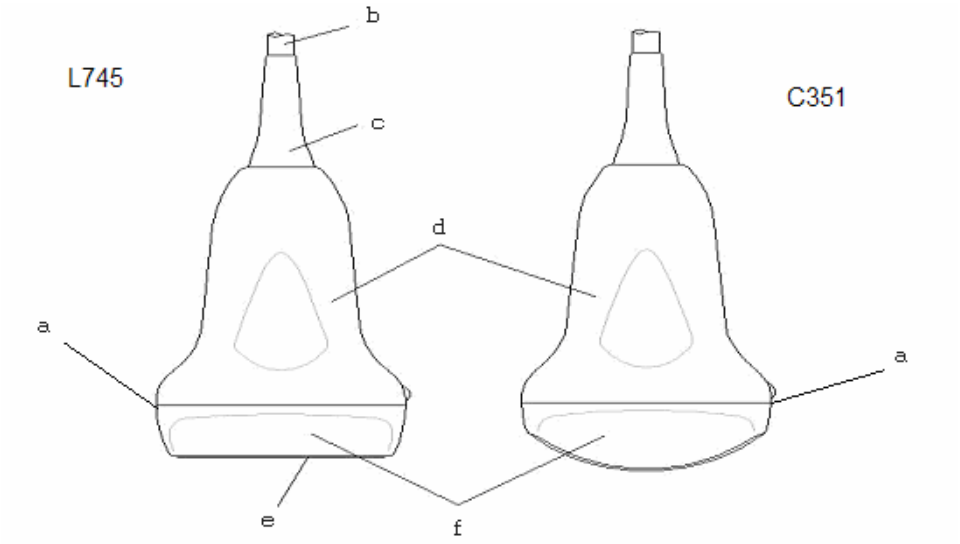


Fig. 5.2.1 Transducer Figuration

a: Bonding boundary

b: Cable

c: Cable sleeve

d: Handle

e: Probe head (acoustic lens)

f: transducer

5.2.1.1 Use endocavity transducer

Every time using and after using the transducer, clean the handle of the endocavity transducer, and disinfect it with chemical disinfectant.

Before using the endocavity transducer for ultrasound exam, cover on the transducer a condom approved by the FDA. Here is the precaution when covering a disposable condom:

NOTE:

1. Some patients are allergic to natural rubber of medical device containing rubber. The FDA recommends that before using the endocavity transducer for ultrasound exam, the doctor shall identify such patients and prepare measures against such allergy immediately.

2. Only water-solubility material or water-solubility jelly is allowed to use on the transducer head. Derivative from oil or mineral oil may damage transducer surface.

3. It is strongly recommended to use condoms approved by the FDA.

Here are the procedures to handle an endocavity transducer:

1. Put on medical disinfected gloves.
2. Take out a condom from its package.
3. Fill appropriate ultrasound coupling gel in the condom.
4. Hold the condom with one hand, and insert the acoustic lens section of the transducer.
5. Fix the condom at the end of the transducer handle.
6. Check if the condom is broken during this process. If it is, replace with a new condom, and repeat the steps above.

5.2.2 Cleaning

Every time using the transducer, clean the transducer handle, and disinfect the endocavity transducer with chemical disinfectant.

Remove the ultrasound gel on the transducer with soft cloth, and wash away any residue on the transducer with running water. Then clean the transducer with warm moderate suds. If necessary, clean the transducer and remove the visible residue on the surface of the endocavity transducer with soft cloth.

Clean the transducer with sufficient clean drinking water, wash away visible suds residue on the transducer, and air dry it.

NOTE:

1. Before cleaning the transducer, remove the protective cover on the transducer (e.g. disposable condom).
2. During the cleaning of endocavity transducer, it is important to ensure that all surfaces of the endocavity transducer is cleaned thoroughly.

5.2.3 Disinfection

The transducer shall be disinfected with liquid chemical disinfectant (e.g. glutaraldehyde solution) approved by the FDA. The solution shall be mixed, stored and used following its manufacturer's product instruction. It is effective to disinfect transducers with 2% glutaraldehyde solution, which is considered to be the disinfectant most compatible to transducer material.

Do not process the transducer with high-pressure steam or have it contact any ethylene oxide. In no circumstances shall heat disinfection be applied. Temperature higher than 150 F (66℃) may damage the transducer.

Immerse the transducer head in the disinfectant for not less than 20 minutes, but no more than 1 hour. The immersion section shall not exceed the transducer bonding boundary. The transducer should not be immersed in any liquid completely, otherwise it may lead to permanent damage.

To ensure efficacy of the disinfectant, clean the transducer thoroughly before disinfection. Make sure that not any residue is on the transducer. Here are the disinfection steps for a transducer:

- According to the precautions for storage, usage and handling of the disinfectant, follow the supplier's instruction to prepare the disinfectant.
- Immerse the cleaned and dried transducer in the prepared disinfectant following the requirement.
- When the transducer is immersed or placed into the disinfectant, rotate or shake the transducer section in the disinfectant to clear off any bubble and ensure a thorough contact between the transducer and the disinfectant. For high-level disinfection, perform the disinfection procedure by following the supplier's suggested duration.
- Withdraw the transducer from the disinfectant, and the disinfection for the transducer is finished. Clean off the disinfectant on the transducer thoroughly with water, and then wipe it up with soft dry cloth.
- Air dries the transducer.

5.3 Service Method

5.3.1 Service Method

When any abnormality occurs, shut off the power supply and inform our service engineer of the detailed situation. If possible, send a failure picture to our service engineer. We will provide prompt service. A detailed failure report will help us to shorten the service time.

If the fuse is broken, the fuse can be replaced by following our service engineer's instruction. The fuse is 50T-0160H 250V. Two fuses of this model were packed with the system as accessories. The same fuses can be purchased from the local market. If the same broken fuse issue happens again after replacement, please inform our service engineer immediately.

5.3.2 Service responsibility

The system is a sophisticated electronic system. Except for simple maintenance, for field service, our authorized service contractor or we will replace the defective parts.

When repair or adjustment of the system is required, please contact us. We are not responsible for any failure caused by the service conducted by others.

5.3.3 Service contact information

SonoScape Co., Ltd.

9/F, Yizhe Building, Yuquan Road, Nanshan District,

Shenzhen , Guangdong Province, China

Post Code: 518051

Tel: 400-678-8019

Fax: 86-755-26722850

Email: service@sonoscape.net

Appendix A Descriptions of Signs

SIGNS	Title	Description
	Attention	To ensure safety, please refer to the attached user 's manual when you find this symbol on the system.
	Equi-potentiality	To eliminate potential difference, the connecting port connected with the housing should be connected with the corresponding ports of other equipment.
	Shelter	Auxiliary protective ground
	Type B	B: Max. Patient leakage current: normal situation ≤100 μA, with one defect ≤ 500 μA
IP	Enclosed	To protect against dust and immersion as per requirements in IEC529.
	On/Off	Switch of the primary power supply
	Non-ionization radiati on	Ultrasound scanner transmits acoustic waves.
	Sterile/ Disinfecting	The system is in sterile state.

Appendix B Principle for Using Acoustic Power

ALARA

Please observe ALARA (As Low As Reasonably Achievable) principle when using ultrasound. So far there is no confirmed evidence to prove that ultrasound has obvious harm to humans, but the users shall be cautious when using ultrasound. Provided that sufficient diagnostic information is acquired, try to shorten the time to examine the patient with the probe on one body position. The ultrasound power and acoustic intensity are relevant to scanning time. The user shall observe ALARA principle to select an appropriate ultrasound power for the exam based on his exam needs.

Ultrasound Effects

Ultrasound effect shall include heating and cavitation.

Heating effect: Ultrasound in nature is mechanical wave. During its propagation in human body, the human tissues are oscillated, heat is generated, and human tissue temperature rises. Be vigilant to damage due to the heating effect, and always follow ALARA principle.

Cavitation: Cavitation can occur when sound passes through an area that contains small bubbles. With ultrasound impact on these small bubbles, temperature and pressure around the space of the bubbles will increase, or even oscillate and explode, which may result in physical or chemical effects on the surrounding tissues.

Relevant Parameters

The main parameters related to acoustic power are: transmit frequency, transmit focus number, transmit voltage, transmit angle, element pitch, etc. These parameters vary subject to exam modes. Follow ALARA principle to select the appropriate power for scanning.

Appendix C The information of Representatives

SONOMED

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Appendix D Maximum Acoustic Output Report

Table1-1. Transducer Model: 6-2MHz C351 Curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.66	0.09	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.15					
	P	(mW)		5.9	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.5				#	
	z at max $I_{pi.\alpha}$	(cm)	4.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.1	3.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.9	#	#	#	#
		Y (cm)		1.3	#	#	#	#
Other information	t_d	(μsec)	0.56					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.84					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	32.0					
	Focal Length	FL_x (cm)		5	#	#		#
		FL_y (cm)		5	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4.2	4.2	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 1-2. Transducer Model: 6-2MHz C351 Curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.54	0.11	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.02					
	P	(mW)		6.3	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.7				#	
	z at max $I_{pi.\alpha}$	(cm)	4.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.6	3.6	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.9	#	#	#	#
		Y (cm)		1.3	#	#	#	#
Other information	t_d	(μsec)	0.476					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.82					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	25.6					
	Focal Length	FL_x (cm)		5	#	#		#
		FL_y		5	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 1-3. Transducer Model: 6-2MHz C351 Curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.66	#	#	0.22	0.60	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.17					
	P	(mW)		#	#		33.1	#
	min of	(mW)				15.5		
	z_s	(cm)				4.6		
	z_{bp}	(cm)				2.67		
	z_b	(cm)	4.5				4.5	
	z at max $I_{pi.\alpha}$	(cm)	4.5				4.5	
	$d_{eq}(z_b)$	(cm)					0.04	
	f_{awf}	(MHz)	3.1	#	#	3.1	3.1	#
	Dim of A_{aprt}	X (cm)		#	#	1.8	1.8	#
		Y (cm)		#	#	1.3	1.3	#
Other information	t_d	(μsec)	0.553					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.87					
	d_{eq} at max I_{pi}	(cm)					0.04	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	31.3					
	Focal Length	FL_x (cm)		#	#	5		#
		FL_y(cm)		#	#	5		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		5	#	#	5	5	#
	PRF		4	#	#	4	4	#
	Power		100	#	#	100	100	#

Table 2-1. Transducer Model: 6-2MHz C352 Curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.64	0.086	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.13					
	P	(mW)		5.8	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.5				#	
	z at max $I_{pi.\alpha}$	(cm)	4.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.1	3.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.9	#	#	#	#
		Y (cm)		1.4	#	#	#	#
Other information	t_d	(μsec)	0.56					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.80					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	30.8					
	Focal Length	FL_x		5	#	#		#
		FL_y		5	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4.2	4.2	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 2-2. Transducer Model: 6-2MHz C352 Curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.53	0.09	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.00					
	P	(mW)		6.2	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.7				#	
	z at max $I_{pi.\alpha}$	(cm)	4.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.6	3.6	#	#	#	#
	Dim of A_{aprt}	X (cm)		2.0	#	#	#	#
		Y (cm)		1.4	#	#	#	#
Other information	t_d	(μsec)	0.476					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.79					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	24.9					
	Focal Length	FL_x (cm)		5	#	#		#
		FL_y (cm)		5	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 2-3. Transducer Model: 6-2MHz C352 Curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.65	#	#	0.21	0.58	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.14					
	P	(mW)		#	#		32.5	#
	min of	(mW)				15.2		
	z_s	(cm)				4.6		
	z_{bp}	(cm)				2.65		
	z_b	(cm)	4.5				4.5	
	z at max $I_{pi.\alpha}$	(cm)	4.5				4.5	
	$d_{eq}(z_b)$	(cm)					0.04	
	f_{awf}	(MHz)	3.1	#	#	3.1	3.1	#
	Dim of A_{aprt}	X (cm)		#	#	1.9	1.9	#
		Y (cm)		#	#	1.4	1.4	#
Other information	t_d	(μsec)	0.553					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.82					
	d_{eq} at max I_{pi}	(cm)					0.04	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	30.1					
	Focal Length	FL_x (cm)		#	#	5		#
		FL_y(cm		#	#	5		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		5	#	#	5	5	#
	PRF		4	#	#	4	4	#
	Power		100	#	#	100	100	#

Table 3-1. Transducer Model: 8-3MHz C352 Curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.64	0.086	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.13					
	P	(mW)		5.8	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.5				#	
	z at max $I_{pi.\alpha}$	(cm)	4.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.1	3.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.9	#	#	#	#
		Y (cm)		1.4	#	#	#	#
Other information	t_d	(μsec)	0.56					
	prr	(Hz)	4219					
	p_r at max I_{pi}	(MPa)	1.80					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	30.8					
	Focal Length	FL_x		5	#	#		#
		FL_y		5	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4.2	4.2	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 3-2. Transducer Model: 8-3MHz C543 Curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.96	0.14	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.91					
	P	(mW)		7.2	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	3.5				#	
	z at max $I_{pi.\alpha}$	(cm)	3.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.0	4.0	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.4	#	#	#	#
		Y (cm)		1.0	#	#	#	#
Other information	t_d	(μsec)	0.422					
	prr	(Hz)	4202					
	p_r at max I_{pi}	(MPa)	3.09					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	65.1					
	Focal Length	FL_x (cm)		4	#	#		#
		FL_y (cm)		3	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	4	4	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 3-3. Transducer Model: 8-3MHz C543 Curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.88	#	#	0.23	0.66	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.84					
	P	(mW)		#	#		31.3	#
	min of	(mW)				10.8		
	z_s	(cm)				3.5		
	z_{bp}	(cm)				2.0		
	z_b	(cm)	3.5				3.5	
	z at max $I_{pi.\alpha}$	(cm)	3.5				3.5	
	$d_{eq}(z_b)$	(cm)					0.034	
	f_{awf}	(MHz)	4.4	#	#	4.4	4.4	#
	Dim of A_{aprt}	X (cm)		#	#	1.4	1.4	#
		Y (cm)		#	#	1.0	1.0	#
Other information	t_d	(μsec)	0.380					
	prr	(Hz)	4202					
	p_r at max I_{pi}	(MPa)	3.12					
	d_{eq} at max I_{pi}	(cm)					0.034	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	63.0					
	Focal Length	FL_x (cm)		#	#	4		#
		FL_y(cm)		#	#	3		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		4	#	#	4	4	#
	PRF		4	#	#	4	4	#
	Power		100	#	#	100	100	#

Table 4-1. Transducer Model: 11-5MHz L745 Linear Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.66	0.33	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.63					
	P	(mW)		11.3	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.8				#	
	z at max $I_{pi.\alpha}$	(cm)	1.8				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	6.1	6.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.2	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.280					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.40					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max	(W/cm^2)	73.4					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	8	8	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 4-2. Transducer Model: 11-5MHz L745 Linear Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.50	0.19	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.02					
	P	(mW)		9.1	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.5				#	
	z at max $I_{pi.\alpha}$	(cm)	1.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.3	4.3	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.2	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.464					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	3.09					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	31.4					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	8	8	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 4-3. Transducer Model: 11-5MHz L745 Linear Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.76	#	#	0.87	1.4	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.90					
	P	(mW)		#	#		51.8	#
	min of	(mW)				29.6		
	z_s	(cm)				1.8		
	z_{bp}	(cm)				1.4		
	z_b	(cm)	1.8				1.8	
	z at max $I_{pi.\alpha}$	(cm)	1.8				1.8	
	$d_{eq}(z_b)$	(cm)					0.016	
	f_{awf}	(MHz)	6.2	#	#	6.2	6.2	#
	Dim of A_{aprt}	X (cm)		#	#	1.2	1.2	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.275					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.78					
	d_{eq} at max I_{pi}	(cm)					0.016	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	93.7					
	Focal Length	FL_x (cm)		#	#	2		#
		FL_y(cm)		#	#	2		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		2	#	#	2	2	#
	PRF		8	#	#	8	8	#
	Power		100	#	#	100	100	#

Table 5-1. Transducer Model: 11-5MHz L746 Linear Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.65	0.32	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.61					
	P	(mW)		10.9	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.8				#	
	z at max $I_{pi.\alpha}$	(cm)	1.8				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	6.1	6.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.2	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.280					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.38					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max	(W/cm^2)	72.5					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	8	8	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 5-2. Transducer Model: 11-5MHz L746 Linear Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.49	0.18	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.00					
	P	(mW)		9.0	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.5				#	
	z at max $I_{pi.\alpha}$	(cm)	1.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.3	4.3	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.2	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.464					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	3.02					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	30.8					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	8	8	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 5-3. Transducer Model: 11-5MHz L746 Linear Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.73	#	#	0.85	1.3	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.88					
	P	(mW)		#	#		51.5	#
	min of	(mW)				29.1		
	z_s	(cm)				1.8		
	z_{bp}	(cm)				1.4		
	z_b	(cm)	1.8				1.8	
	z at max $I_{pi.\alpha}$	(cm)	1.8				1.8	
	$d_{eq}(z_b)$	(cm)					0.016	
	f_{awf}	(MHz)	6.2	#	#	6.2	6.2	#
	Dim of A_{aprt}	X (cm)		#	#	1.2	1.2	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.275					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.75					
	d_{eq} at max I_{pi}	(cm)					0.016	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	93.0					
	Focal Length	FL_x (cm)		#	#	2		#
		FL_y(cm)		#	#	2		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		2	#	#	2	2	#
	PRF		8	#	#	8	8	#
	Power		100	#	#	100	100	#

Table 6-1. Transducer Model: 11-5MHz L773 Linear Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.75	0.17	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.82					
	P	(mW)		5.8	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.7				#	
	z at max $I_{pi.\alpha}$	(cm)	1.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	6.0	6.0	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.7	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.256					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.57					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max	(W/cm^2)	105.9					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	8	8	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 6-2. Transducer Model: 11-5MHz L773 Linear Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.72	0.13	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.76					
	P	(mW)		4.8	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.7				#	
	z at max $I_{pi.\alpha}$	(cm)	1.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	5.9	5.9	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.7	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.267					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.46					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	98.7					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	8	8	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 6-3. Transducer Model: 11-5MHz L773 Linear Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.77	#	#	0.45	1.09	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.87					
	P	(mW)		#	#		29.9	#
	min of	(mW)				16.1		
	z_s	(cm)				1.7		
	z_{bp}	(cm)				1.7		
	z_b	(cm)	1.7				1.7	
	z at max $I_{pi.\alpha}$	(cm)	1.7				1.7	
	$d_{eq}(z_b)$	(cm)					0.021	
	f_{awf}	(MHz)	5.9	#	#	5.9	5.9	#
	Dim of A_{aprt}	X (cm)		#	#	1.7	1.7	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.253					
	prr	(Hz)	7692					
	p_r at max I_{pi}	(MPa)	2.64					
	d_{eq} at max I_{pi}	(cm)					0.021	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	100.9					
	Focal Length	FL_x (cm)		#	#	2		#
		FL_y(cm)		#	#	2		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		2	#	#	2	2	#
	PRF		8	#	#	8	8	#
	Power		100	#	#	100	100	#

Table 7-1. Transducer Model: 13-6MHz 10L2 Linear Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			1.09	0.13	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	3.00					
	P	(mW)		3.5	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.4				#	
	z at max $I_{pi.\alpha}$	(cm)	1.4				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	7.6	7.6	#	#	#	#
	Dim of A_{aprt}	X (cm)		0.9	#	#	#	#
		Y (cm)		0.5	#	#	#	#
Other information	t_d	(μsec)	0.225					
	prr	(Hz)	5714					
	p_r at max I_{pi}	(MPa)	4.34					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max	(W/cm^2)	176.6					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 7-2. Transducer Model: 13-6MHz 10L2 Linear Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.28	0.18	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	0.95					
	P	(mW)		3.2	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.5				#	
	z at max $I_{pi.\alpha}$	(cm)	1.5				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	11.8	11.8	#	#	#	#
	Dim of A_{aprt}	X (cm)		0.9	#	#	#	#
		Y (cm)		0.5	#	#	#	#
Other information	t_d	(μsec)	0.493					
	prr	(Hz)	5714					
	p_r at max I_{pi}	(MPa)	1.72					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	16.1					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 7-3. Transducer Model: 13-6MHz 10L2 Linear Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.98	#	#	0.30	0.79	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	2.70					
	P	(mW)		#	#		14.2	#
	min of	(mW)				8.4		
	z_s	(cm)				1.4		
	z_{bp}	(cm)				1.4		
	z_b	(cm)	1.4				1.4	
	z at max $I_{pi.\alpha}$	(cm)	1.4				1.4	
	$d_{eq}(z_b)$	(cm)					0.029	
	f_{awf}	(MHz)	7.6	#	#	7.6	7.6	#
	Dim of A_{aprt}	X (cm)		#	#	0.9	0.9	#
		Y (cm)		#	#	0.5	0.5	#
Other information	t_d	(μsec)	0.227					
	prr	(Hz)	5714					
	p_r at max I_{pi}	(MPa)	3.85					
	d_{eq} at max I_{pi}	(cm)					0.029	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	165.8					
	Focal Length	FL_x (cm)		#	#	2		#
		FL_y(cm)		#	#	2		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		2	#	#	2	2	#
	PRF		6	#	#	6	6	#
	Power		100	#	#	100	100	#

Table 8-1. Transducer Model: 9-4MHz 6V4 Micro-curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.62	0.13	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.42					
	P	(mW)		4.9	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	3.7				#	
	z at max $I_{pi.\alpha}$	(cm)	3.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	5.3	5.3	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.1	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.329					
	prr	(Hz)	6329					
	p_r at max I_{pi}	(MPa)	2.82					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	36.8					
	Focal Length	FL_x (cm)		4	#	#		#
		FL_y (cm)		3	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	4	4	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 8-2. Transducer Model: 9-4MHz 6V4 Micro-curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.48	0.12	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	0.98					
	P	(mW)		5.7	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	3.8				#	
	z at max $I_{pi.\alpha}$	(cm)	3.8				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.1	4.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.1	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.459					
	prr	(Hz)	6329					
	p_r at max I_{pi}	(MPa)	1.68					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	44.9					
	Focal Length	FL_x (cm)		4	#	#		#
		FL_y (cm)		3	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	4	4	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 8-3. Transducer Model: 9-4MHz 6V4 Micro-curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.63	#	#	0.12	0.40	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.45					
	P	(mW)		#	#		11.9	#
	min of	(mW)				4.6		
	z_s	(cm)				3.6		
	z_{bp}	(cm)				1.3		
	z_b	(cm)	3.6				3.6	
	z at max $I_{pi.\alpha}$	(cm)	3.6				3.6	
	$d_{eq}(z_b)$	(cm)					0.077	
	f_{awf}	(MHz)	5.3	#	#	5.3	5.3	#
	Dim of A_{aprt}	X (cm)		#	#	1.1	1.1	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.327					
	prr	(Hz)	6329					
	p_r at max I_{pi}	(MPa)	2.89					
	d_{eq} at max I_{pi}	(cm)					0.077	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	85.6					
	Focal Length	FL_x (cm)		#	#	4		#
		FL_y(cm)		#	#	3		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		4	#	#	4	4	#
	PRF		6	#	#	6	6	#
	Power		100	#	#	100	100	#

Table 9-1. Transducer Model: 9-4MHz 6V5 Micro-curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.60	0.12	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.41					
	P	(mW)		4.8	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	3.7				#	
	z at max $I_{pi.\alpha}$	(cm)	3.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	5.3	5.3	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.1	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.330					
	prr	(Hz)	6329					
	p_r at max I_{pi}	(MPa)	2.78					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	36.5					
	Focal Length	FL_x (cm)		4	#	#		#
		FL_y (cm)		3	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	4	4	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 9-2. Transducer Model: 9-4MHz 6V5 Micro-curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.47	0.12	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	0.95					
	P	(mW)		5.6	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	3.8				#	
	z at max $I_{pi.\alpha}$	(cm)	3.8				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.1	4.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.1	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.458					
	prr	(Hz)	6329					
	p_r at max I_{pi}	(MPa)	1.62					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	43.8					
	Focal Length	FL_x (cm)		4	#	#		#
		FL_y (cm)		3	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	4	4	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 9-3. Transducer Model: 9-4MHz 6V5 Micro-curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.61	#	#	0.12	0.39	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.43					
	P	(mW)		#	#		11.8	#
	min of	(mW)				4.5		
	z_s	(cm)				3.6		
	z_{bp}	(cm)				1.3		
	z_b	(cm)	3.6				3.6	
	z at max $I_{pi.\alpha}$	(cm)	3.6				3.6	
	$d_{eq}(z_b)$	(cm)					0.077	
	f_{awf}	(MHz)	5.3	#	#	5.3	5.3	#
	Dim of A_{aprt}	X (cm)		#	#	1.1	1.1	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.325					
	prr	(Hz)	6329					
	p_r at max I_{pi}	(MPa)	2.85					
	d_{eq} at max I_{pi}	(cm)					0.077	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	84.9					
	Focal Length	FL_x (cm)		#	#	4		#
		FL_y(cm)		#	#	3		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		4	#	#	4	4	#
	PRF		6	#	#	6	6	#
	Power		100	#	#	100	100	#

Table 10-1. Transducer Model: 5-2MHz C312 Micro-curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.63	0.25	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.12					
	P	(mW)		16.3	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.7				#	
	z at max $I_{pi.\alpha}$	(cm)	4.7				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.2	3.2	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.9	#	#	#	#
		Y (cm)		1.4	#	#	#	#
Other information	t_d	(μsec)	0.540					
	prr	(Hz)	3497					
	p_r at max I_{pi}	(MPa)	1.87					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max	(W/cm^2)	28.0					
	Focal Length	FL_x (cm)		5	#	#		#
		FL_y (cm)		5	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 10-2. Transducer Model: 5-2MHz C312 Micro-curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.52	0.28	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	0.99					
	P	(mW)		16.4	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	4.9				#	
	z at max $I_{pi.\alpha}$	(cm)	4.9				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	3.6	3.6	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.9	#	#	#	#
		Y (cm)		1.4	#	#	#	#
Other information	t_d	(μsec)	0.468					
	prr	(Hz)	3497					
	p_r at max I_{pi}	(MPa)	1.82					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	22.8					
	Focal Length	FL_x (cm)		5	#	#		#
		FL_y (cm)		5	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	5	5	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 10-3. Transducer Model: 5-2MHz C312 Micro-curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.62	#	#	0.24	0.47	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.11					
	P	(mW)		#	#		30.2	#
	min of	(mW)				15.6		
	z_s	(cm)				4.7		
	z_{bp}	(cm)				4.7		
	z_b	(cm)	4.7				4.7	
	z at max $I_{pi.\alpha}$	(cm)	4.7				4.7	
	$d_{eq}(z_b)$	(cm)					0.048	
	f_{awf}	(MHz)	3.2	#	#	3.2	3.2	#
	Dim of A_{aprt}	X (cm)		#	#	1.9	1.9	#
		Y (cm)		#	#	1.4	1.4	#
Other information	t_d	(μsec)	0.541					
	prr	(Hz)	3497					
	p_r at max I_{pi}	(MPa)	1.86					
	d_{eq} at max I_{pi}	(cm)					0.048	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	27.4					
	Focal Length	FL_x (cm)		#	#	5		#
		FL_y(cm		#	#	5		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		5	#	#	5	5	#
	PRF		4	#	#	4	4	#
	Power		100	#	#	100	100	#

Table 11-1. Transducer Model: 9-4MHz C612 Micro-curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.78	0.26	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.70					
	P	(mW)		11.3	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	2.2				#	
	z at max $I_{pi.\alpha}$	(cm)	2.2				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.8	4.8	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.1	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.316					
	prr	(Hz)	3676					
	p_r at max I_{pi}	(MPa)	2.43					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	89.5					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	3	3	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 11-2. Transducer Model: 9-4MHz C612 Micro-curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.86	0.22	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.73					
	P	(mW)		11.3	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	2.1				#	
	z at max $I_{pi.\alpha}$	(cm)	2.1				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.1	4.1	#	#	#	#
	Dim of A_{aprt}	X (cm)		1.1	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.475					
	prr	(Hz)	3676					
	p_r at max I_{pi}	(MPa)	2.33					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	75.6					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	4	4	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 11-3. Transducer Model: 9-4MHz C612 Micro-curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.78	#	#	0.38	0.81	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.70					
	P	(mW)		#	#		30.2	#
	min of	(mW)				16.7		
	z_s	(cm)				2.1		
	z_{bp}	(cm)				2.1		
	z_b	(cm)	2.1				2.1	
	z at max $I_{pi.\alpha}$	(cm)	2.1				2.1	
	$d_{eq}(z_b)$	(cm)					0.028	
	f_{awf}	(MHz)	4.8	#	#	4.8	4.8	#
	Dim of A_{aprt}	X (cm)		#	#	1.1	1.1	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.316					
	prr	(Hz)	3676					
	p_r at max I_{pi}	(MPa)	2.40					
	d_{eq} at max I_{pi}	(cm)					0.028	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	92.3					
	Focal Length	FL_x (cm)		#	#	2		#
		FL_y(cm)		#	#	2		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		2	#	#	2	2	#
	PRF		4	#	#	4	4	#
	Power		100	#	#	100	100	#

Table 12-1. Transducer Model: 9-4MHz EC2 Micro-curved Array

Operating Mode: B-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-Scan	
					A_{aprt}≤1cm^2	A_{aprt}>1cm^2		
Maximum index value			0.82	0.31	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.82					
	P	(mW)		13.1	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	2.0				#	
	z at max $I_{pi.\alpha}$	(cm)	2.0				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.9	4.9	#	#	#	#
	Dim of A_{aprt}	X (cm)		0.8	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.303					
	prr	(Hz)	5714					
	p_r at max I_{pi}	(MPa)	2.57					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	107.9					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		B	B	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 12-2. Transducer Model: 9-4MHz EC2 Micro-curved Array

Operating Mode: THI-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1cm		
Maximum index value			0.90	0.22	#	#	#	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.80					
	P	(mW)		11.7	#		#	#
	min of	(mW)				#		
	z_s	(cm)				#		
	z_{bp}	(cm)				#		
	z_b	(cm)	1.8				#	
	z at max $I_{pi.\alpha}$	(cm)	1.8				#	
	$d_{eq}(z_b)$	(cm)					#	
	f_{awf}	(MHz)	4.0	4.0	#	#	#	#
	Dim of A_{aprt}	X (cm)		0.8	#	#	#	#
		Y (cm)		0.6	#	#	#	#
Other information	t_d	(μsec)	0.440					
	prr	(Hz)	5714					
	p_r at max I_{pi}	(MPa)	2.33					
	d_{eq} at max I_{pi}	(cm)					#	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	85.4					
	Focal Length	FL_x (cm)		2	#	#		#
		FL_y (cm)		2	#	#		#
Operating control conditions	Mode		THI	THI	#	#	#	#
	Focus	(cm)	2	2	#	#	#	#
	PRF	(kHz)	6	6	#	#	#	#
	Power	(%)	100	100	#	#	#	#

Table 12-3. Transducer Model: 9-4MHz EC2 Micro-curved Array

Operating Mode: M-mode

Index label			MI	TIS			TIB	TIC
				Scan	Non-scan		Non-scan	
					A_{aprt}≤1c	A_{aprt}>1c		
Maximum index value			0.80	#	#	0.25	0.85	#
Associated acoustic parameters	$p_{r,\alpha}$	(MPa)	1.77					
	P	(mW)		#	#		19.4	#
	min of	(mW)				10.5		
	z_s	(cm)				2.0		
	z_{bp}	(cm)				1.1		
	z_b	(cm)	2.0				2.0	
	z at max $I_{pi.\alpha}$	(cm)	2.0				2.0	
	$d_{eq}(z_b)$	(cm)					0.027	
	f_{awf}	(MHz)	4.9	#	#	4.9	4.9	#
	Dim of A_{aprt}	X (cm)		#	#	0.8	0.8	#
		Y (cm)		#	#	0.6	0.6	#
Other information	t_d	(μsec)	0.307					
	prr	(Hz)	5714					
	p_r at max I_{pi}	(MPa)	2.46					
	d_{eq} at max I_{pi}	(cm)					0.027	
	$I_{pi.\alpha}$ at max MI	(W/cm^2)	106.6					
	Focal Length	FL_x (cm)		#	#	2		#
		FL_y(cm		#	#	2		#
Operating control conditions	Mode		M	#	#	M	M	#
	Focus		2	#	#	2	2	#
	PRF		6	#	#	6	6	#
	Power		100	#	#	100	100	#